the OIL AND GAS JOURNAL

Whatever your rock bit problem **HUGHES HAS THE ANSWER!**

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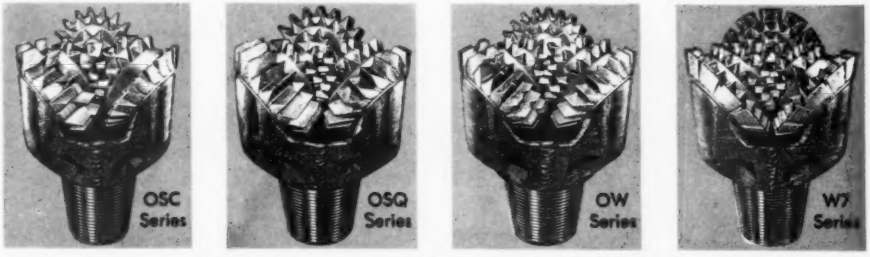
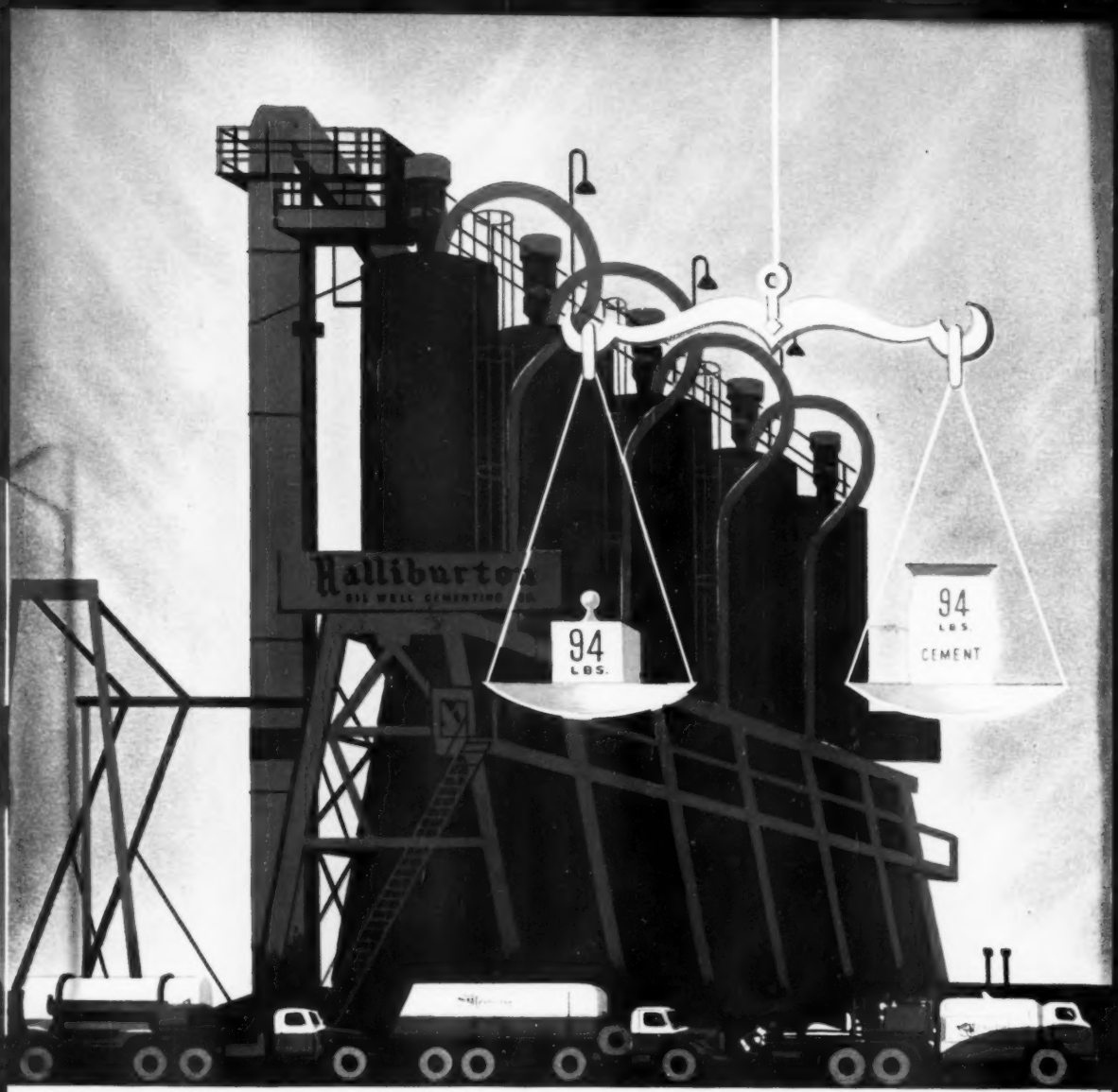
HOUSTON, TEXAS
WORLD STANDARD
OF THE INDUSTRY



From grass roots to total depth, there is a specially designed Hughes Rock Bit for each formation . . . your assurance of fast, full-gage, straight hole . . . an "Engineered Solution" for your every drilling problem.

PRICE 50 CENTS TABLE OF CONTENTS PAGE 19 **JANUARY 5, 1950**



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There is no substitute for experience in oil well cementing

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"LOW COST PER UNIT OF WORK"

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Why is Bethlehem rope the top choice among so many users? Basically, it's because it gives them their money's worth . . . gives them *low cost per unit of work.*

A unit of work varies with the industry involved. For example, it can be a cubic yard of rock moved; or a ton of coal hauled up a hillside; or a ton-mile in oil-country rotary drilling. If a wire rope accounts for a great many units of work during its lifetime, it is a good, sound buy (that's Bethlehem!). Sound because it is still in service, still producing, long after it has justified its purchase price.

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with your present furnace and stack

Coppus-Dennis FANMIX Burners Give You More Heat with No Other Major Change in Equipment

Coppus-Dennis **FANMIX** Burners give you *perfect* mechanical mixing of fuel and air *at the burner outlet . . . instantaneous* ignition close to the burner . . . and *complete* combustion *without visible flame* when burning natural gas. No other burner combines these three advantages.

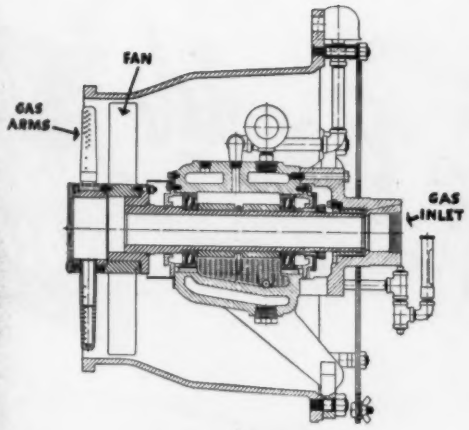
Because **FANMIX** delivers the *right* mixture of fuel and air *without blow-torch action*, all of your furnace space is used for combustion . . . *none for mixing*. That's why your present furnace can release more heat . . . why new installations can get more heat out of smaller furnace space.

Because **FANMIX** can be guaranteed to secure complete combustion of natural gas *with less than 5% excess air*, you get uniform "radiant heat" *without drifting hot spots*. That's why a **FANMIX**-fired furnace seldom varies in temperature more than 5% over its entire area.

WRITE FOR ALL THE FACTS

When you see in Bulletin 410-6 how fuel escaping from orifices in rotating driver arms rotates the fan to draw the correct proportion of air into the path of the fuel at right angles . . . how **FANMIX** creates its own forced draft, reduces stack requirements, prevents cracking of "wet" gas . . . how two **FANMIX** types handle either gas or oil or any combination of both — you'll understand why **FANMIX** Burners have such wide acceptance in oil refineries and power plants.

Send for the Coppus-Dennis **FANMIX** Bulletin 410-6. Coppus Engineering Corporation, Worcester 2, Mass. Sales Offices in THOMAS' REGISTER. Other Coppus "Blue Ribbon" products in BEST'S SAFETY DIRECTORY, CHEMICAL ENGINEERING CATALOG, and REFINERY CATALOG.



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Baroid

IMPERMEX INSURES AGAINST MUD TROUBLES

Contaminants flocculate ordinary drilling muds. Flocculation causes high water loss, which may result in stuck drill pipe, fishing jobs, loss of hole. This unhappy cycle plagues many a drilling operation in which the mud carries no protection against contamination.

Impermex, Baroid's organic colloid, gives such protection by preventing the adverse effects of cement, salt, gypsum, anhydrite, and other drilling mud contaminants. Impermex provides drilling mud with extraordinarily low water loss—as low as 1 cc. A.P.I. in many cases, and easily controllable viscosity and gel characteristics. Thus, no matter what the drilling conditions, Impermex makes any clay mud a superior mud.

Drilling, particularly in deep wells, presents enough problems without the additional hazard of an unprotected drilling mud. Records show hundreds of modern operators protect their wells with Impermex when the going gets tough.

SOUTHERN OKLAHOMA . . .
CASE XXX

On this well, drill stem tests from the Simpson recovered several thousand feet of water contaminated by salt and sulphur compound, and the clay-water mud became badly contaminated, resulting in a very high water loss. This mud was treated with alkalizing agents and Impermex over a 12-hour period.

	Contaminated Mud	Same, after treatment
Weight	10.0 lbs. per gal. (75.5 lbs.cu.ft.)	10.0 lbs. per gal. (75.5 lbs.cu.ft.)
Viscosity	50 sec. API	43 sec. API
Water Loss	52 cc API	1.8 cc API
Salt	1.7% by weight	. . . .
Cake Thickness	. . . .	1/32" API
pH	7.9	12.5

Caving of the Pennsylvania shales stopped at once; tight hole in porous zones was overcome, and the well was carried 2000 feet deeper with no trouble.

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P.O. Box 2258, Terminal Annex, Los Angeles 54, Calif.
Send me detailed information on IMPERMEX.

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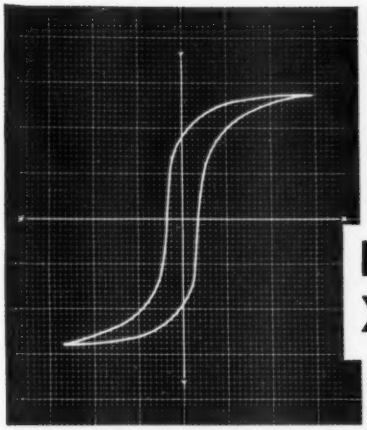


NOW you can plot X vs Y... automatically

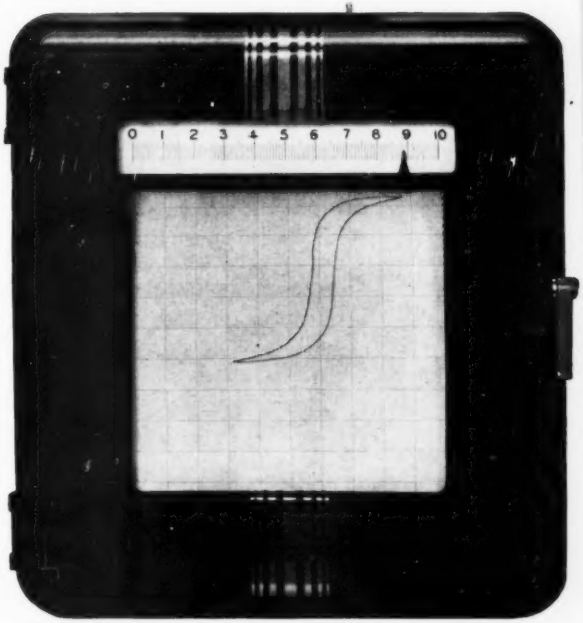
A new Speedomax Recorder..

now automatically plots the relationship between two variables, showing one as a function of the other. Tedious compilation and manual plotting by experienced personnel are eliminated. Instead, the variables to be plotted are converted to d-c signals, and connected to the instrument, one to the horizontal axis and the other to the vertical axis. The result is a permanent record, accurately plotting in minutes data that would require hours using the point by point method.

As compared to the usual recorder, which has only one measuring circuit and a constant speed non-reversing chart paper drive and which plots a variable as a function of time, this new recorder has two measuring circuits. Pen travel (X axis) is controlled by our well known Speedomax G vacuum tube circuit. A similar circuit controls the chart paper drive, (Y axis) and makes it reversible. Thus, the new recorder makes it possible automatically to draw curves such as the hysteresis loop shown, temperature vs temperature difference, stress vs strain or other two-variable curves.

Response of the instrument is amply fast. The pen takes only 3 seconds for full scale travel of 9⅞". Full chart travel is 10" and requires 4 seconds. Standard minimum voltage for full travel of either coordinate is 10 mv.

For further information, write to Leeds & Northrup Company, 4959 Stenton Avenue, Philadelphia 44, Pennsylvania.



Standard minimum range is 10 mv d-c for full deflection of either function.

Two electronic circuits—one for each function.

Large chart: about 100 square inches.

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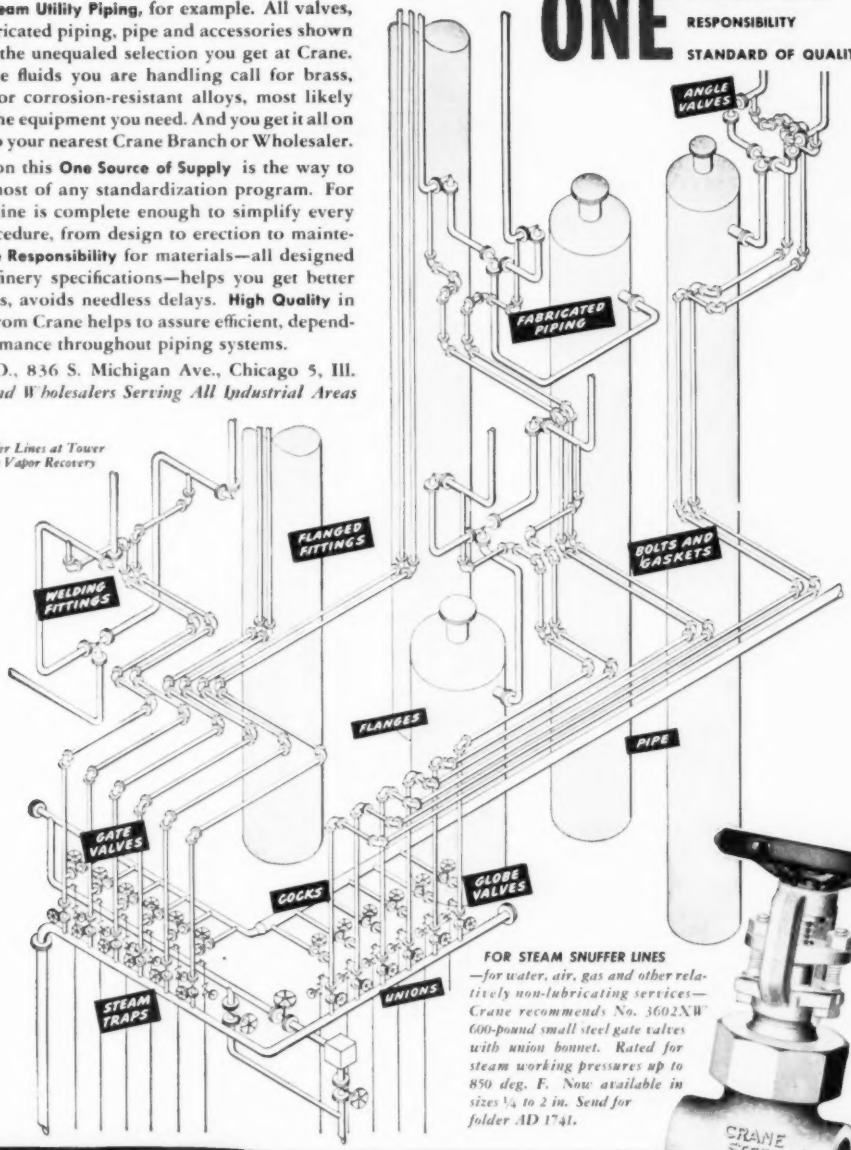

Steam Snuffer Lines at Tower Structure on Vapor Recovery Unit.

FOR STEAM SNUFFER LINES
—for water, air, gas and other relatively non-lubricating services—Crane recommends No. 3602XW 600-pound small steel gate valves with union bonnet. Rated for steam working pressures up to 850 deg. F. Now available in sizes ¼ to 2 in. Send for folder AD 1741.

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* "ANSWER ME TWICE."—IN ACTION, PRESSURE ADDED TO ONE DIAPHRAGM, SUBTRACTED FROM OTHER.

HEAVY DUTY HIGH PRESSURE SERVICE

Use of double diaphragm with valve position controller enables this power to be available in either direction at any point of valve position. Single seated diaphragm control valves are now procurable with a power actuator which will give positive tight shut-off service. ... WRITE FOR BULLETIN B-4200

FISHER GOVERNOR CO., Marshalltown, Iowa

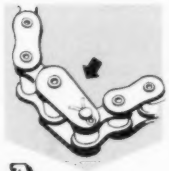
WHERE YOU SEE THIS... YOU SEE

Longer Chain Life, Lower Chain Cost, Easy Adjustment, Faster Service!

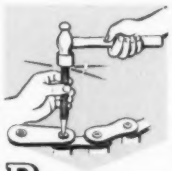
This distinctive "teardrop" shape link marks the new "BA"... Baldwin Assembly . . . oil field roller chain. And it's the mark of long low-cost drilling service.

The new "BA" assembly roller chain gives you all the advantages of riveted roller chain . . . long life . . . greater strength . . . lower cost . . . plus even greater ease of field assembly and disassembly than with old style detachable roller chains.

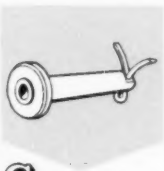
HERE'S HOW SIMPLE IT IS!



A The single pin connector is the heart of the "BA" assembly and is readily identified by its "teardrop" shape. One pin in this link has a cotter on one end; the other end is spun over a washer. The other pin is fully riveted to the adjacent link, thus assuring the assembly of the superior life of riveted chain.



B To take the chain apart, simply remove the cotter on the single pin connector link and drive out the pin. Pin is a slip fit through the chain except for a milled flat on the cottered end which is fitted into a special hole in the connector plate. There is no danger of destroying fits or damaging parts with this chain.



C The single pin connector of the "BA" assembly fits snugly into place . . . even though it is a slip fit through virtually the entire link. The washer spun over one end of the pin and the milled flat on the cottered end that is fitted into the special hole in the connector plate, plus the cotter, hold the pin firmly in place.

D An important advantage to you is the fact that the other end of the single pin connector link is firmly riveted to the adjacent link. When the single pin connector is removed, this riveted pin holds the chain parts together, preventing plates from falling out and greatly simplifying assembly.

For all the facts on the "BA" assembly, Rex A.P.I. Chains and Rex Oil Field Pumps, see your local supply store or write Chain Belt Company, 1619 W. Bruce Street, Milwaukee 4, Wis.

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ROLLER CHAINS

a complete line from ¼-inch to 2½-inch pitch

CHAIN BELT REX COMPANY

A.P.I. CHAINS

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These famous rotary drilling chains . . . *the chains that have grown up with the oil fields* . . . are built especially for oil field needs. Their ability to take the stresses and strains of tough drilling is the result of such outstanding features as:

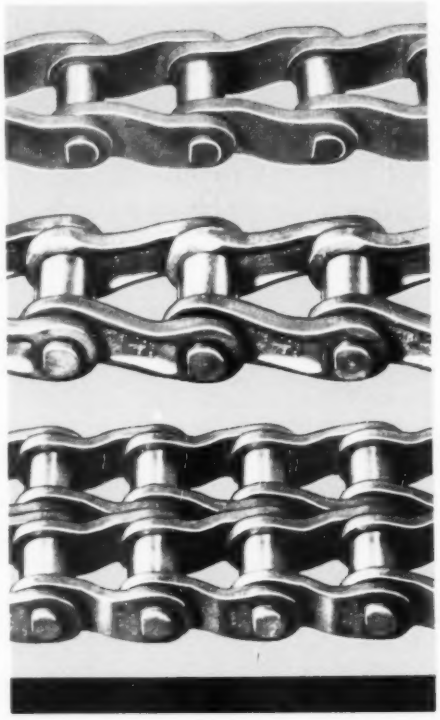
BALANCED DESIGN, an important Rex advantage that balances the strength of the chain parts for increased efficiency . . . longer life . . . lighter weight.

MAXIMUM WEAR RESISTANCE, effected by carefully hardened and finished pins, bushings and rollers. All are made from solid stock alloy steel. Pins and rollers are of heat treated, high carbon alloy steel. Bushings are of alloy steel, case hardened for wear resistance.

FORCE FIT ASSEMBLY. Chain parts are carefully machine-assembled to form the famous Rex Unit-Link. Each link is exactly alike . . . each is put together to stay . . . to retain its strength and uniformity under the toughest of drilling conditions.

EFFECTIVE LUBRICATION that prolongs chain life. Oil holes in the bushings put oil where it is needed.

EASY TO TAKE APART. Rex 3-diameter pin makes assembly and dis-assembly easy. No need for heavy driving or the use of drift pins.



Rex Champion Chabelco A. P. I. No. 3. Ultimate strength 75,000 pounds.

Rex Champion Chabelco A. P. I. No. 4. Ultimate strength 170,000 pounds.

Rex D3125 A. P. I. No. 3½. Ultimate strength 230,000 pounds.

CHAIN BELT REX COMPANY

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THE IDEAL PUMP OF OIL FIELD UTILITY SERVICE

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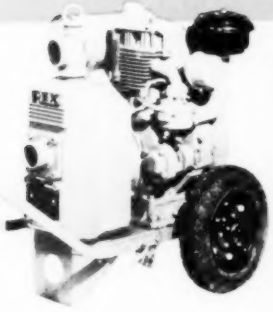
For dependable utility service, rely on Rex, the "little yellow pump." You just start the motor and forget the pump. It keeps right on going while there's water to pump.



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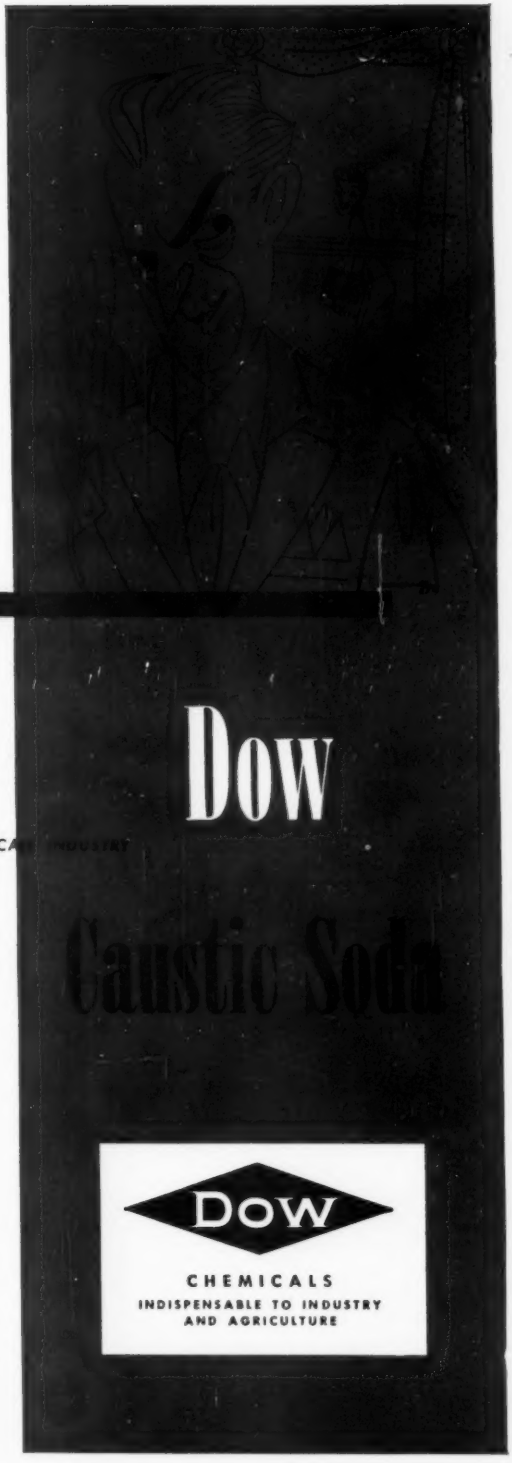
F A M O U S

Caustic Comments

When invited to attend a dinner party given by a snobbish socialite, the late John Barrymore replied in caustic tones, "I'm frightfully sorry I won't be able to come, Mrs. Bore. I have a previous engagement which I shall make just as soon as I possibly can!"



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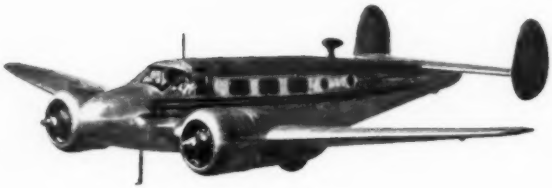
Beechcraft 18

The twin-engine Beechcraft Executive Transport is relied upon all over the world for fast, dependable performance. This 200-mph plane carries 7 to 9 passengers in luxurious comfort — can be operated readily out of small fields.



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UNEQUALED EXPERIENCE
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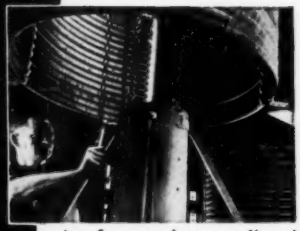

Aerofin manufactures finned heat-transfer surface exclusively. The experience gained by such specialization permits the selection of just the right surface and materials for each particular job — for each application.

When you specify Aerofin finned heat-transfer surface, you specify high efficiency, long life and easy maintenance. As pioneer in the field, Aerofin has developed unequaled know-how and production facilities to apply to your particular heat-transfer application. Continual research accounts for the accuracy of Aerofin's published ratings. You can use them with full confidence.

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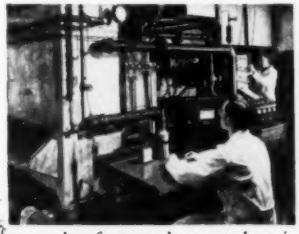

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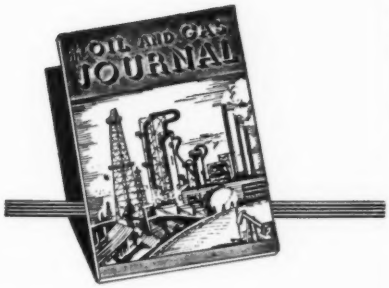

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JOURNALLY Speaking

We Say

THIS department is not supposed to carry any editorial opinion, hemmed in as it is on the starboard by the Editorial Page which carries the official opinion of this publication, and on the port side by "They Say," which reprints the opinions of others.

However, this being the first of the year, when resolutions, predictions, and similar brash and futile statements are quite in season, we are emboldened to bust loose with an editorial opinion of our own. It's a gripe we've been nursing for some years. It probably isn't very important, or else the Boss would have done an editorial on it or somebody would have made a speech or written a letter. But here goes, anyway.

We are going to attack the federal Government. This ought to be reasonably safe, because we notice that regular editorial writers do this occasionally, and apparently get away with it.

Specifically, what we're mad at is the Census Bureau, the Labor Department, and the other Washington agencies which periodically get out statistics on business activity, cost of living, and kindred subjects. Half the time they will have a grouping headed "Products of Coal and Petroleum."

Now, may we ask, what earthly use is a statistic on wages, or prices, or anything, which applies to the whole gamut of products of coal and petroleum? What do these products have in common? True, most coal and some petroleum are burned to make steam or heat, and some chemicals which used to be derived from coal tar are now being made from a petroleum base.

But outside of that the two industries are as different as night and day in every respect. Their wages, prices, investments, earnings, level of activity, and other aspects are determined independently of each other. What possible logic motivates the Greatest Government in the World to dump the oil industry ignominiously into the coal scuttle has always eluded our comprehension.

Wake up, Uncle Sam. Get hep to the fact that petroleum is one of the largest and most progressive industries you have. It is entitled to some statistics of its very own. It's high time your bureaucrats got out of their rut and quit treating oil like a stepchild of coal.

There. Now that we've unloaded that editorial wallop we resolve to keep opinion subtly suppressed in this department the rest of the year.

Pencil Oil

AN alumnus of this institution of journalism, Warren W. Burns, who had the good sense to desert the typewriter-beating racket for the greener pastures of the oil industry proper, has now become a "veep" of one of the numerous family of companies with California in the title, and he demonstrated his magnanimity toward his still-ink-stained former colleagues by distributing some very elegant pencils as Christmas largess.

The nether, or business, end of this implement functions admirably for writing purposes, but the upper portion thereof consists of a rod of one of these lustrous new plastics in which slowly moves a miniature can of lubricating oil labeled (in case you couldn't guess) "RPM."

Inquiry as to the mechanical workings of this novelty elicited the confession that the rod is not, as might be assumed, filled with a petroleum product. It seems the pencil manufacturer, through an obvious breach of etiquette or the proprieties, selected some sort of vegetable oil as having more desirable viscosity and transparency characteristics.

This triumph of nature over petrochemistry should not be tolerated. The California Oil Co. should at once put its researchers to work developing a suitable pencil oil.

Henry D. Ralph

They Say—

Refining Losses

"Its net savings (Consumers Cooperative Association) were down nearly 99 per cent—from a record of $8,320,206 in 1947-48 to $86,334 (in 1948-49). This is explained by losses on petroleum refining operations due to the drastic drop in prices of heavy fuels; losses on the 'tail ends' of various contracts made during the postwar scarcity period; and to the fact that in general 'prices have declined faster than costs.' It is pointed out that in the 2 years—1947-48, the inflationary 'up' year, and 1948-49, the 'down' year—C.C.A. had total savings of $8,406,540, or an average of $4,203,270."

Release issued following annual meeting of C.C.A. in Kansas City.

No Incentive

"Sir:

"I note the second paragraph of 'Cit-Con' editorial (December 8) regarding opportunities in the oil business. It is true but for the federal income tax.

"A man making a net income of $10,000 retains only about $600 per month; $15,000, about $850; $20,000, about $1,000; $25,000, about $1,200; and $50,000, about $2,000.

"So what is the advantage when compared to all the responsibilities associated with even a moderate success?"

J. P. M.
Dallas

Texas Oil and Business

"The business pulse of Texas is synchronized with the heart beat of the state's No. 1 industry—petroleum production and processing; $2.4 billion from the 1947 sale of crude oil, natural gas, and their products, when put in the bloodstream of the state's economy helped to push up business indices and cash register totals all over Texas.

"The widely spread nature of the Texas petroleum industry is one key to the impact of oil and gas operations on the state's economy. All 254 counties either have production or oil men have acreage under lease for exploration."

Texas Oil and Gas, published by Texas Mid-Continent Oil and Gas Association.

Informed Employes

"There is a broader aspect of the employe-relations field that should be emphasized. This is the creation in the minds of employes of an understanding of our American economy based on competition and a full realization of what the consequences would be if we were to lose our freedoms. . .

"There has been much 'viewing with alarm' by businessmen, as we are doing now, but little in the way of aggressive, concrete action. Much of the action that has been taken has found businessmen persuading other businessmen to accept principles in which they already believe. We will never make headway simply by talking to ourselves. Workers, in most of industry, have had to depend largely on accidental exposure and their own common sense for whatever accurate ideas they have about how our economic machinery works. It is no wonder many of them, as well as people in other walks of life, are confused."

J. W. Keener, vice president, B. F. Goodrich Co., addressing the Society for Advancement of Management, New York.

And Beauty, Too

"An oil field located in a 'park' is an apt description of beautiful western Michigan where production from Stony Lake and Pentwater pools has lifted Carter into the rank of the No. 1 producer in the state.

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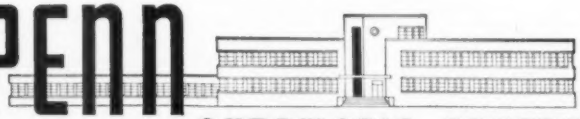

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and streams. Fishing and other vacation sports vie with the growing of big red cherries and red and yellow apples as big business for the area. The company pays meticulous attention to the prevention of damage to the land or waters. Dumaw creek, which teems with trout, winds its way through the heart of Pentwater field. Fishing in this beautiful stream will never be marred by salt-water or oil contamination.

"All salt water produced with the oil is being returned below the surface through salt-water disposal wells. No derricks mark the well sites in the rolling hills. Only inconspicuous wellhead connections and gleaming tank batteries show that oil is being produced."

The Link, Carter Oil Co.

Too-Low Allowances

"In the high-cost period since the end of the war, nearly all businesses have found their depreciation allowances inadequate. Many, Jersey among them, had their problem intensified by the fact that during the war, when materials of many kinds were unobtainable, their replacement programs had to be deferred. They had accounted for depreciation on their books but were unable to replace the depreciated property. They have had to catch up on replacement at a time when it was more expensive than ever before.

"To some extent the stringencies caused by making replacements during times of high costs are compensated for by similar replacements when costs are low. But, because the long-term trend of most costs seems to be upward, this compensation is unlikely to balance out."

The Lamp, Standard Oil Co. (N. J.)

Oil Imports

"The importing companies are looking out for their own interests, and they are under pressure from the oil-producing countries, who are looking out for their own interests. The domestic producers are going to have to fight for themselves. . . .

"The oil man whose production has been cut back is going to have to face his banker sooner or later. I've seen no evidence of such a trend yet, but it stands to reason that, when your note comes due and can no longer be renewed, you're going to sell your oil for what you can get."

Russell B. Brown, general counsel, I.P.A.A., speaking in Dallas.

Restrictions on Imports

"The pressure of foreign oil to invade American markets is increasing at an alarming rate. Imports that averaged 513,000 bbl. per day in 1948 increased to more than 600,000 bbl. per day in 1949 and, based on the importing companies' own estimates, will exceed 800,000 bbl. per day during the first quarter of 1950. That will represent an increase of about 60 per cent in 2 years' time.

"The market for oil produced in this country has been further curtailed because of the reduction of oil exported to foreign markets. Add together the increase in oil imports to the decrease in oil exports and the total represents the loss of market suffered by the domestic industry. This loss of market because of foreign oil has contributed greatly to the reduction that has taken place in domestic production. If domestic production must be restricted, why should not imports also be restricted?"

J. Ed Warren, writing in the Independent, Independent Petroleum Association of America.

Oil's Security

"I don't believe you oil men can have the freedom you deserve if you do not have some measure of security from your Government, protecting you with depletion allowances and protecting you against foreign oil imports."

Sen. Lyndon B. Johnson, addressing oil men in Midland, Tex.

Depletion Allowance

"The depletion allowance in the computation of the income tax of oil producers is an essential incentive necessary to the discovery and development of oil reserves."

J. Ed Warren, I.P.A.A. president, speaking in Midland, Tex.

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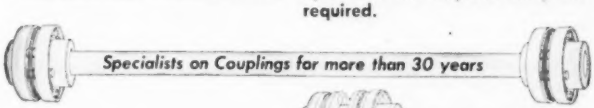

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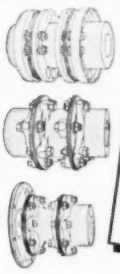

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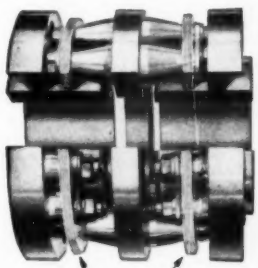

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the OIL AND GAS JOURNAL

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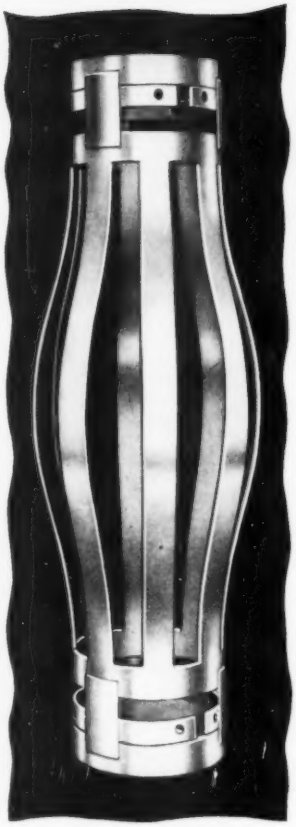
"TORTURE TESTING" definitely proves Baker Model "G"



Casing Centralizers provide MAXIMUM CENTERING FORCE

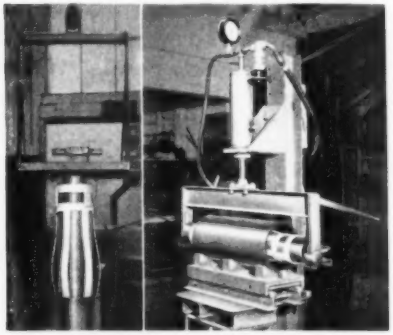
Only when "maximum centering force" is applied to casing at the cementing point, can you obtain a sufficient annular space to permit uniform distribution of the cement slurry completely around the casing. The hazard of channeling is minimized, and chances for successful "first time" cementing are increased.

The test of any casing centralizer is its ability to exert MAXIMUM CENTERING FORCE *after* repeated flattening of its springs during the trip down-hole. That's why the Baker testing laboratory has been kept in constant use during the designing, development and actual proving of the Baker Model "G" Casing Centralizer. Comprehensive tests, simulating every conceivable hole condition to which a centralizer is subjected, were performed in arriving at its efficient design.

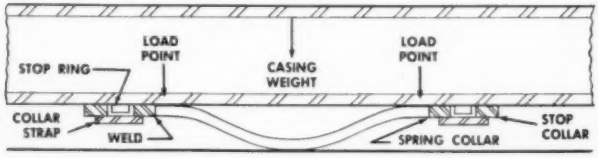
During the course of these tests, every type of spring-equipped centralizer was studied. The exclusive design of the Baker Centralizer proved conclusively to be the optimum.

And here are the outstanding features of the Baker Model "G" Casing Centralizer confirmed by "torture testing" . . . 1. Its MAXIMUM CENTERING FORCE is exerted when it reaches the cementing point, regardless of how many times the springs have been flattened due to "dog legs" or tight spots in the hole. 2. The springs are securely butt-welded to the spring collars in a design that imposes the load point *upon the casing*. 3. *All springs compress simultaneously*, and cannot be compressed individually. 4. The *casing can be rotated* while the centralizer remains stationary. 5. It starts easily, without "snubbing." 6. All parts of the assembly are pre-positioned, ready for immediate, easy installation on the casing.

Ask any Baker representative or office for *your* copy of the new 16-page brochure which contains complete details and illustrations of the Baker Model "G" Casing Centralizer.



LEFT: Testing to determine the maximum number of springs of optimum bowed height to permit easy starting without "snubbing." RIGHT: With this testing device it is possible not only to simulate rugged down-hole travel by repeatedly flattening the springs, but also to find the effective centering force of the centralizer in the open hole after such treatment. The MAXIMUM CENTERING FORCE can easily be determined from a performance curve showing the centering force at various intervals of deflection.



Here is the ideal in spring design and mounting, found only in the Baker Model "G" Casing Centralizer. Note how the load point is imposed directly upon the casing; and how the properly "contoured" spring is free to move along the smooth surface of the casing as it deflects under compression. There is no chance for concentration of stress to cause a permanent set, or breaking of the spring. Note that ample clearance exists between Stop Rings and Centralizer Collars to accommodate the increased length of the springs that results from their complete flattening.

***Remember!* You get MAXIMUM CENTERING FORCE only with BAKER Model "G" CASING CENTRALIZERS**

BAKER OIL TOOLS, INC. HOUSTON • LOS ANGELES • NEW YORK

A Seasoned Compact

THE winter meeting of the Interstate Oil Compact Commission provided additional evidence that this voluntary agreement is well established in its position of national leadership in those matters applying to the conservation of petroleum and natural gas.

This cooperative arrangement, in its fifteenth year, has had the needed seasoning. Its membership is in a position to serve the best interests of the oil states and the entire nation as never before.

It is now recognized that there never was any basis for the fear on the part of some that the compact was a device which favors the large producing states over the small. The 20 active members are equal in all matters applying to policy. The strength of the agreement lies in the fact that participation is entirely voluntary and members can quickly withdraw.

While three meetings annually provide for discussion and action in matters of general interest to the membership and the entire oil industry, the compact's accomplishments largely stem from the interim work of the executive committee, the standing committees, and the headquarters staff at Oklahoma City. Recent reports reflect the scope and importance of these several activities.

The legal committee, after prolonged study, has provided a suggested oil and gas conservation statute for old and new oil states which competent observers have said is a model and at the same time a wholly practical regulatory law. The importance of secondary recovery in adding to the oil wealth of the states has always been recognized by the compact. A recent notable achievement was a comprehensive survey on secondary activities in Kansas which is to be followed by similar reports covering other areas. It has served as a clearing house for the entire oil industry in this important phase of its operations.

The engineering committee has completed the manuscript for a handbook. The research and coordination group has made valuable reports on the underground storage of natural gas. The economics advisory group, composed of several of the industry's leading economists, supplies statistical studies covering demands.

The headquarters staff, operating on a modest budget, coordinates all the work of the committees and issues reports regularly covering matters of special interest to the members. Effective work is being done along public-relations lines, with literature and films.

Thus the petroleum states, pioneering in a plan wisely provided for by the framers of our Constitution, after an occasional false start and through trial and error, have arrived at their goal. New problems that inevitably arise in everything applying to oil will appear, but the vehicle of government needed to solve them is at hand.

THIS WEEK

ECONOMICS—Forecasters are vague and wary in predicting course of business during 1950. . . . Most expect high activity during first half of year but didn't look farther into the future. . . . Oil industry expected to parallel trends of general business activity. . . . ¶Bureau of Mines places 1949 crude-oil output at 1,800,000,000 bbl., a decrease of 8 per cent from 1948. . . . Value of crude, natural gas, and light hydrocarbons at point of production more than double that of coal. . . .

L.P.G.—Sales of liquefied petroleum gas in 1949 were 8.5 per cent over previous year. . . . Contrast with 25-30 per cent gains of recent years shows leveling off of market expansion. . . . But future outlook appears good.

INTERNATIONAL—British squeeze on dollar oil gets tighter. . . . Now includes Japan. . . . Compromise is talked, but official Washington negotiations report no progress. . . . ¶Hungary nationalizes foreign-owned oil properties. . . . ¶Brazil plans two wildcat tests this year.

INDUSTRY AFFAIRS—Nation's only private project for production of synthetic liquid fuels from coal is dropped by sponsors. . . . Reasons cited: Ample supplies of oil; coal costly and in uncertain supply. . . . ¶Bureau of Mines gives no sign of curtailing its synthetic-fuels ambitions.

TRENDS—Indicated refinery demand for burning oils in 4-week period ended December 24 was 8 per cent greater than in the same period last year. . . . Kerosine demand was up 17 per cent. . . . Distillate demand gained 15 per cent. . . . Demand for residual from domestic refineries was about the same as last year but total residual demand increased since heavy-fuel imports have increased. . . . ¶Large gains by kerosine and distillate indicate some delayed stocking by resellers. . . .

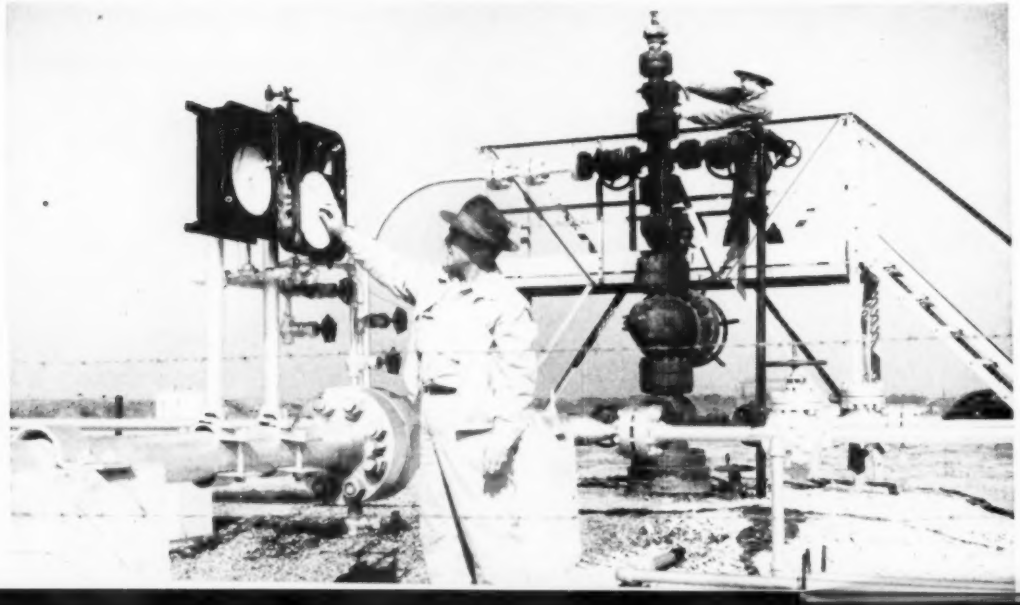
ACTIVITY—Well completions for the week ended December 31 increased to 725, including 107 wildcats. . . . Preliminary weekly reports show a total of 38,403 completions for the year. . . . Wildcat completions reached 6,805 for the year. . . . ¶Crude production for the week ended December 31 was down 5,955 bbl. daily to 4,935,830 bbl. daily. . . . ¶Total number of rotary rigs operating in United States and Canada decreased 52 rigs to 2,200 on December 26. . . .

PIPES LINES—Unusually large number of construction contracts let in recent weeks. . . . Interpreted as indicating that the huge amount of pipe-line work scheduled for 1950 will keep crews and equipment well occupied. . . . ¶Last week Great Lakes Pipe Line Co. awarded 236 miles of 12-in. Tulsa-Kansas City products line. . . . Northern Natural Gas Co. awarded 10 looping sections totaling 587 miles. . . .

REFINING—Biggest Houdriflow unit ever designed will go into operation in March at Sun Oil Co.'s Toledo refinery. . . . ¶Pacific Refiners, Ltd., signs contract with Fish Engineering Corp. for design and construction of a complete butane-asphalt refinery in Hawaii. . . . ¶Construction is under way on new propane-deasphalting unit for British American Oil Co., Ltd., at Clarkson, Ont. . . .

NATURAL GAS—Large-scale invasion of natural gas into Northeast during next 3 years presages three-cornered fuels battle. . . . Price comparisons indicate gas will undersell coal and be stiff competitor to fuel oil. . . .

NATURAL GAS is due for continued expansion in 1950 (see Special Report in this issue). This picture shows one of the reasons why ample gas supplies will be available for new markets. For about 3 years Stanolind Oil & Gas Co. has been extracting liquid products from gas produced with oil in Hastings field, Texas, but had no market for the residue gas. So it was pumped into a deep water sand through wells like this. Now pipe-line outlets are available and this well is delivering between 3 and 4 million cubic feet per day from storage. The unusually large christmas tree is designed for either injection or extraction of gas



Synthetics Reverse

Coal-to-oil pilot-plant operations suspended; companies say gasoline supply, high cost of coal are responsible

George Weber

NEW YORK.—The joint coal-to-gas-to-gasoline research project of Standard Oil Development Co. and Pittsburgh Consolidation Coal Co. will not be extended to the commercial stage in the foreseeable future.

This was the joint announcement by the two companies who this week are suspending operation of the pilot plant at Library, Pa., following a successful run of nearly 15 months.

Completion of pilot-plant studies has assured development of a workable process for gasification of coal and conversion of such "synthetic gases" to gasoline and oil employing a fluidized iron catalyst.

It was pointed out that suspension of pilot-plant runs does not mean abandonment of the project. Basic research on a laboratory scale and evaluation of plant data will continue, to reduce costs of building and operating a commercial plant at such time as it is economically justified.

Ample oil, little coal.—Two reasons were advanced for deferring any commercial application of the synthesis process; a plentiful oil supply and a coal supply of extremely doubtful nature as regards both constant availability and cost.

As stated by Standard Oil Development, a research subsidiary of Standard Oil Co. (N.J.): "With the return of a more nearly normal increase in oil demand and with greatly increased world petroleum supplies, it now appears that the need for converting coal into oil is not pressing, thus allowing time for further basic small-scale research."

George H. Love, president of Pittsburgh Consolidation, went further: "Our joint work here with Standard Oil Development Co. has been done with painstaking care and at great expense. We have proven that the unit can operate on a coking coal and make a gas suitable for synthesis into oils and gasoline.

"However, the commercial aspects of financing and building a large plant to convert coal to gasoline are far less attractive today than they were when we started this work. In fact, they are so bad, from an economic standpoint, that we see no reason to carry on this particular work further at this time.

"To be successful, a plant of the type we had planned would have to have cheap coal and complete assurance of a regular coal supply. Under present circumstances the labor relations in the industry are so bad that none of these things is possible."

Gas looks better.—Love revealed his company's interest in natural-gas conversion. "As far as producing gasoline synthetically is concerned, we have been studying the possibilities of making gasoline from natural gas in Texas by much the same process as we would use to convert coal gas into gasoline. For the present at least, this looks like a more attractive venture because there are huge reserves of cheap natural gas available which is allowed to flow freely 7 days a week without interference by national unions."

The joint research project was first announced in April 1947. The aim was to develop a commercial process converting bituminous coal to high-heat-value gases and the direct synthesis of these gases to high-octane gasoline, diesel fuel, and chemicals. A full-scale plant, tentatively proposed for the Pittsburgh area, would produce gasoline during summer months and high-B.t.u. gas during the winter period of heavy demand.

The following autumn a contract was let to Blaw-Knox Co. for construction of a $500,000 pilot plant at Library, near Pittsburgh. This gasification plant was placed on stream October 10, 1948, and was maintained in continuous operation with few interruptions until this week.

The fluidized gasification process was tested during long periods over a wide range of operating conditions. Producer gas was made in air-blown operation and a good quality synthesis gas was produced by feeding steam and oxygen into the reactor. Tar-free gas was produced in the pilot plant, contrasting with gas made by other methods directly from coal, it was stated by Pittsburgh Consolidation.

Synthetic-gasoline cost by this process is still high, according to Joseph Pursglove, vice president in charge of research for Pittsburgh Consolidation. A gallon of gasoline produced by the pilot plant would cost 19 to 20 cents, roughly 40-50 per cent higher than petroleum-derived gasoline. Coal cost, which still amounts to 50 per cent of product cost, looms large in the economics of the process, and the continued rise in costs of mining coal has contributed largely to the postponement of economic commercial adaptation of the process, it was noted.

Love pointed out that the coal industry urgently needs new markets but said that any commercial development of research discoveries must wait until "we bring a far greater degree of stability to the coal industry."

Announcement of Pittsburgh Consolidation's abandonment of its project followed by only a few days Secretary of the Interior Oscar L. Chapman's disclosure that the coal hydrogenation demonstration plant at Louisiana Mo., had successfully converted coal-tar oil and Wyoming coal into gasoline and other liquid fuels *(The Oil and Gas Journal, December 29, page 83)*.

1950 N.P.C. Roster

Twelve new members have been appointed to the 1950 National Petroleum Council by Secretary of the Interior Oscar L. Chapman.

Among the additions to the council membership are R. B. Anderson, Waggoner Estates, Vernon, Tex.; J. F. Cummins, Cumberland Oil Co., Nashville, Tenn.; A. S. Ritchie, Wichita, Kans.; Ronald V. Rodman, Anderson-Prichard Oil Corp., Oklahoma City; Cecil W. Smith, Montana-Dakota Utilities Co., Minneapolis; P. C. Spencer, Sinclair Oil Co., New York City; S. M. Vockel, Waverly Oil Works, Pittsburgh; W. K. Warren, Warren Petroleum Corp., Tulsa; I. W. Hartman, Mount Pleasant, Mich.; R. H. Hargrove, Texas-Eastern Transmission Co., Shreveport, La.; John L. Bero, National Oil Jobbers' Council, Duluth, Minn.; Baird H. Markham, American Petroleum Institute, New York City.

1949 Summary

Crude output 8 per cent under '48; gas set record

WASHINGTON.—The Bureau of Mines last week summarized 1949 production of underground natural resources, noting that decreased oil output had reversed a 6-year upward trend.

The bureau placed the 1949 crude production at 1,800,000,000 bbl., a drop of 8 per cent from 1948, with a value at the wells of approximately $4,700,000,000, an average of $2.54 per barrel. The decline in production, the bureau said, reflected a break in the rate of increased demand for oil and products, increased imports of foreign oil, and discontinuation of large additions to stocks.

The natural-gas industry continued

its vigorous expansion to a record 1949 marketed production of nearly 6 trillion cubic feet, an increase of 12 per cent over 1948. The 1949 output was valued at about $402,000,000 at the wells and $1,385,000,000 at points of consumption.

The bureau announced that natural-gasoline production also increased, by about 6 per cent over 1948 to a record of 6.5 trillion gallons, but that the total value dropped to $387,000,000 in 1949 owing to declines in unit prices of natural gasoline and liquefied petroleum gases.

The field value of crude oil, natural gas, and light hydrocarbons totaled $5,489,000,000, which is more than twice the value of all the coal produced in 1949, which the bureau placed at $2,206,000,000 for bituminous and $365,000,000 for anthracite, or a total of $2,571,000,000. Bituminous production dropped 28 per cent during the year while the mine price advanced 3 per cent.

NATIONAL AFFAIRS

Anglo-American Feud

Britain seeks to prevent American firms from supplying crude for Japanese refineries; retaliation being discussed

Bertram F. Linz

WASHINGTON.—The Anglo-American oil talks resumed here last week as new complications clouded the possibility of an agreement for relief of Britain's dollar drain.

The latest development was the alleged effort of Britain to control the oil supply of countries outside the sterling area, specifically Japan, where it had been proposed that a balance in the neighborhood of £10,000,000 built up by sales of Japanese goods to England might be used for the purchase of crude for the Japanese refining industry. *(See International.)*

Occupation officials were agreeable to the proposal but suggested that American companies be given an opportunity to participate in the business. Several companies were reported ready to sell oil under such an arrangement provided they could get clearance from the Bank of England for use of the sterling.

It was reported to Washington last week, however, that the British Trade Mission has advised SCAP that American companies may not sell dollar crude to Japan for sterling but only crude purchased from British companies and, further, the sterling must be used to buy Japanese goods for export to the sterling area.

Company officials declared they would lodge a protest with the Government in Washington, where the recent British ban on dollar fuel oil and the cut in dollar gasoline are seen as practically wiping out all chance of an agreement on British-American world oil trade that would be satisfactory to the United States.

At the year end there were no indications that the discussions had reached a point of agreement on any of the problems before the joint group, although all officials concerned were saying nothing about their progress.

Retaliation talked.—Members of Congress returning to Washington for the new session, however, were indicating that a sharp cut in ECA funds was in prospect for the 1951 fiscal year, possibly more than $1,000,000,000.

Congressmen from the oil-producing states have already been "briefed" on the British situation by independent-producer constituents and are expected to make demands for a thorough investigation of the whole question of Marshall-plan aid and its use or misuse by the participating countries before the appropriation is passed on.

Many of them are said to feel that the State Department could take a firm stand, with the support of ECA, and tell the British that if they expect American aid and American dollars they must follow some of the rules ECA has laid down, but if they are going to take away our markets under the excuse of dollar shortage they cannot expect to get ECA funds to help them build up the production which would enable them to do so.

In a report on the situation as viewed by the independents, Russell B. Brown, general counsel of the Independent Petroleum Association of America, characterized the British ban on dollar oil as "realistic, viewed from the standpoint of a nation concerned primarily with personal practical matters and only secondarily with the attainment of global Utopia in the span of a few months."

Brown placed considerable emphasis upon the fact that the ban came only a few months after the American companies operating in Britain had been given assurances that there was no intention of nationalizing the oil industry and had decided to go ahead with their expansion programs.

***AWARD WINNER.**—Dr. Herman E. Ries, Jr., 38-year old head of the physical-chemistry department of Sinclair Refining Co.'s Harvey, Ill., research laboratories, will be awarded the Ipatieff award for outstanding chemical experimental work in the field of catalysis. Presentation of the award, given every 3 years to a scientist under 40 years of age, will be made at the national meeting of the American Chemical Society, to be held in Houston next spring. Research by Dr. Ries has attempted to explain the activity, stability, and selectivity of catalysts in terms of physical properties such as surface areas and pore structures. He has determined these properties as functions of the support, manner of preparation, pellet size, chemical treatment, and thermal history of catalytic materials. Dr. Ries was recently honored as the next winner of the Ipatieff Prize by a dinner in Chicago attended by more than 50 noted scientists. The photograph shows some of those present: Dr. W. D. Harkins, University of Chicago; Dr. Louis Schmerling, first winner of the prize; Dr. Vladimir N. Ipatieff, founder of the award; Dr. Ries; E. W. Isom, vice president of Sinclair; and Eugene C. Herthel, manager, research and development, Sinclair*

Controlled Economy Out?

Truman's economic council advocates fewer government curbs on business, more trust in free enterprise

WASHINGTON. — The Council of Economic Advisers inferentially warned President Truman last week not to renew the demands he made of Congress last year for enactment of legislation to control prices and wages as a means of curing economic ills, although it hinted it might favor such a measure as a standby safeguard against a sudden down-swing in business.

Such controls, the council said, "do not for the long pull answer the basic economic questions confronting the American economic system," and, it added, in peacetime the mere authority to fix prices or wages does not in itself answer the question of what relationship between prices and wages will be fair to all concerned and most conducive to economic stability and growth.

For free enterprise.—While government action can help to iron out minor fluctuations of the business cycle and would be imperative if big ones develop, complete recovery from a substantial down-swing depends primarily upon the revival of private investment, the council held, and because that revival becomes progressively harder to accomplish as the economy moves downward, the main concentration of economic policy should be upon encouraging stability and growth within our free-enterprise system itself.

"Many government policies, if appropriately designed, can place foremost emphasis upon encouraging steady business expansion and thus minimizing the fluctuations in business activity," the council commented. "This approach is sometimes referred to as creating a climate favorable to business. This is true although the responsibility does not lie wholly with government.

"Within enormous areas of action and decision, business holds within its own hands the factors which condition its course. This is the essential nature of a free-enterprise system, and business should be encouraged when government recognizes this cardinal fact."

Bigness not bad.—The President's advisers also warned that the monopoly problem cannot be solved by attacks on bigness in industry, and called for a complete "rethinking" of the problems involving business size and practice.

"In a stable and expanding economy," they said, "there is room both for well-conducted big business (with its unique facilities for scientific and developmental experimentation) and for small business with its display of individualism and self-reliance.

"Small business should be protected from any predatory practices by its larger neighbors, and all business should be protected against unfair competitive practices by units of any size. Yet the truth at least in part is that small business is threatened not primarily by big business but rather by big instabilities in the economy.

"An economy that grows steadily, as our economy can, would provide manifold opportunities for small business. Small business has some unique problems of obtaining financing, and more efforts should be directed toward solving these problems."

The cardinal need, the council indicated, is for a shift from government planning on the basis of expediency to the achievement of more harmony and consistency among government programs which affect the whole economy. This does not call for the establishment of more agencies or committees, it said, but for "a unifying framework within which each separate economic policy may be tested against its effect upon the general economy and upon the promotion of maximum opportunities for employment and production in free, competitive enterprise."

Oil-Tax Collections

WASHINGTON.—Treasury collections from the three oil taxes during 1949 reached the $600,000,000 mark and were more than $15,000,000 above the total for 1948, it was indicated this week.

These estimates were based on Internal Revenue Bureau figures for the first 11 months, showing collections in excess of $550,000,000 as against $536,000,000 for the same period in 1948.

The figures on gasoline indicated that all records for consumption were broken in 1949. At 1½ cents per gallon, the government collected $457,474,828 in the first 11 months of the year compared with $444,492,825 in the same period of the preceding year.

Collections on lubricating oils showed a moderate increase in the 11-month period, $75,597,679 against $75,040,294 in 1948, but receipts from pipe-line transportation dropped slightly, to $17,228,298 from $17,326,932.

CHANGED PRODUCTION RATES.—Oil operators in nearby Blue Ridge field have reported changes in the producing rates of their wells since this spectacular salt mine cave-in 10 miles southwest of Houston. A warehouse-office building and a $20,000 salt-press building of Gulf Salt Co. were destroyed on Christmas Eve by the huge crater, which is 180 ft. long, 112 ft. wide, and 50 ft. deep. An official of Sharp Oil Corp., which has a producer ¾ mile away, told the Journal the well's production increased 50 per cent shortly after the cave-in. Another operator on the opposite side of the field from the crater reported that one of his wells is making considerably more gas. He does not know yet if any increased oil will result as the well has been shut down for servicing. Blue Ridge field was discovered in 1919 and has 50 producing wells. Production is from pay around the salt dome from which Gulf Salt Co. was recovering salt

Eastern Free-for-All

Invasion of natural gas into East Coast Area challenges traditional supremacy of fuel oil, coal in heating markets

Dahl M. Duff

NEW YORK.—The continual battle between oil and coal over the rich fuel market of northeastern United States is gradually turning into a three-cornered affair with the entrance of a third contender, natural gas.

With the advantage of convenience, continuity of supply, and price, oil for years has had the upper hand over coal. Now oil faces the prospect of having its steady expansion at least slowed by competition from its own sister industry.

Natural gas has moved into the Northeast fuel market as a result of the construction of big-inch, long-distance pipe lines from the Southwest. Prior to the war, these lines were confined generally to the central third of the country.

The phenomenal expansion of the natural-gas industry since the end of the war has already brought Texas and Louisiana gas through two systems to the Northeast Seaboard area, and a third major line is under construction. If all presently planned expansion of these three systems is carried out, total throughput will be nearly 3 billion cubic feet daily.

This total amount of gas on a B.t.u.-equivalent basis is equal to about 500,000 bbl. daily of oil fuel. This is approximately the amount of last year's total distillate demand in the Atlantic Seaboard District 1.

Opinions differ. — Of course, no one expects the oil industry to lose its East Coast distillate market overnight, or even any sizable part of it. There is a wide divergence of opinions on exactly what and how much the oil industry will lose.

Marketing - economics departments of several major oil companies have recently made detailed studies of the probable impact of the advent of natural gas on fuel and heating-oil sales in the Northeast. The concern over the situation was also shown in statements made at the opposite ends of the oil industry.

In Texas, Olin Culberson of the Railroad Commission reiterated the long-held view of some state officials in the Southwest that export of gas should be restricted. He said gas is cutting into markets for Texas oil and asserted gas would displace any fuel in its price range. In New York, the publication of the Empire State Petroleum Association recently called for a national policy on gas expansion to prevent it from flooding heating-oil markets and "reducing the ability of the oil industry to meet national emergencies."

The densely populated and highly industrialized Northeast is the nation's top fuel market. More than 45 per cent of all oil house-heating burners are in New York, New Jersey, and New England. The existing distribution systems for manufactured gas connect to about one-third of the nation's gas meters in roughly the same area. But because of the relatively high cost of manufactured gas, consumption per customer is now less than one-fifth the national average on a B.t.u. basis.

Invasion plans.—Natural gas will be moving into this area in increasing volume over the next 3 or 4 years. Some natural gas already is reaching the Northeast through connections with Tennessee Gas Transmission Co. and in the Texas Eastern Transmission Corp. system consisting of the converted wartime Big Inch oil lines.

T.G.T. has Federal Power Commission authorization to extend its system to Buffalo, N. Y., and increase capacity to 1,060,000,000 cu. ft. daily. This company has an application before the commission for a further extension to Worcester, Mass., and another capacity increase to 1,260,000,000 cu. ft. daily.

Texas Eastern, now authorized 740,000,000 cu. ft. daily, has asked FPC approval of a third line to bring total deliveries up to 1,165,000,000 cu. ft. daily. Through Texas Eastern, New York City received its first natural gas in August when the company started delivering up to a maximum of 4,000,000 cu. ft. daily to New York & Richmond Gas Co. on Staten Island.

Major deliveries into New York City will commence in October when the 1,876-mile line of Transcontinental Gas Pipe Line Corp. goes into initial operation. Authorized 340,000,000 cu. ft. daily, hearings are now under way in Washington on the application to the bring the line to full capacity of 505,000,000 cu. ft. daily and extend the system through New York to the Connecticut state line.

First casualty.—Aside from the long-term outlook, the immediate prospect insofar as oil markets are concerned is the loss of an increasing part of its sales of both the distillate and residual which is now used in manufactured gas. Estimates are that about 80 utilities now distributing largely manufactured gas in the Northeast area, including Pennsylvania, will take natural gas, in practically all cases as much as they are allotted from the transmission systems.

Some of these companies ultimately plan to go to the distribution of straight natural gas; others will use the natural gas as a substitute for oil in the enrichment of the manufactured product. A variety of plans have been made by these distributing utilities. Manufactured - gas facilities

Construction which will lead to the movement of natural gas into the New York metropolitan area beginning next fall is illustrated in this photograph and the one on the following page. Here workmen are laying a section of Transcontinental Gas Pipe Line Corp.'s line from the Rio Grande Valley of Texas. Scene is the edge of the Hudson River opposite 132nd Street. In the right background may be seen the big gas holder of Consolidated Edison, which will receive gas from the line

are being retained in many cases for supplementing during times of peak loads, for standby, and also to avoid loss of a large part of the rate base.

American Gas Association data show that in 1948, last year for which figures are available, 885,970,000 gal. of oil was used by the manufactured-gas industry in New England, New York, New Jersey, and Pennsylvania. This is equivalent to about 57,850 bbl. daily. Converted to a barrel-daily basis, the figures are:

	New England	Middle Atlantic
Gas oil	5,470	7,100
Residual and other heavy	6,180	39,100
Total	11,650	46,200

Not all of this will be taken over by natural gas. The outlook, however, is for the loss of a substantial part, and oil marketers have long been familiar with the process by which a relatively small amount of distress material can undermine an entire market.

Another and potentially greater effect of natural gas on Northeast oil markets is with the ultimate fuel users. In general it appears that natural gas, provided its final prices are attractive, can win over many customers who otherwise would use oil heat.

Skim the cream.—One well-informed oil-company economist, discussing the possibility, saw nothing particularly alarming in the situation. He said the advent of natural gas in the Northeast will "flatten out" the curve of upward demand for heating oil, but not result in any declining usage.

He emphasized that there are three fuels in the market and that the "weak sister" is coal. In the Middle West, natural gas has been coming in in increasing volume for some time, yet distillate demand there continues to bear about the same percentage of the total national market. Furthermore, experience in other cities indicates that residential gas rates are not sufficiently lowered with natural gas to affect oil sales seriously.

Against this view is that of other individuals who foresee a fuel revolution in the making, with damaging results for oil heat. Their belief is that gas can take over about any oil-heating customer it wishes. Regulated rates insure a reasonably stable price for gas without the fluctuations characterizing the oil market.

While it is obviously impractical to build sufficient transmission pipe-line capacity to meet all or even a majority of the heating requirements of the Northeast, gas will be able to take the "cream" of the market. This includes new construction which is particularly desirable for the gas industry since it includes water heating and cooking with year-around load. Furthermore, building contractors favor gas heating since installation cost is less.

It is also pointed out that many oil burners installed prewar are now facing replacement and that these can be gained by the gas industry. Gas heating, its advocates emphasize, requires no mechanical burner with increased electricity cost and maintenance expense. When natural gas with its lower cost comes to New England, the range-oil market will be especially affected since gas can be readily extended in combination stove and water-heating units.

View of Transcontinental's line at Edgewater, N. J., as it extends up from the Hudson River and starts across the Palisades toward the Jersey meadows

Price comparisons.—Present manufactured-gas prices in the Northeast are high relative to other fields, and lower prices will be necessary if the distributing utilities are to widen their markets as a result of their new supplies of natural gas. They could, however, find a wide market for gas on an interruptible basis as industrial fuel, which can be sold at prices ranging downward from 37 cents per M.c.f., but such sales are discouraged by the Federal Power Commission.

Present prices for 1 million B.t.u.'s of gas in eastern cities include the following: Washington $1.04; Portland $1.59; Philadelphia $1.49; Newark $1.25; and New York $1.58. One million B.t.u.'s is roughly a thousand cubic feet of natural gas or 1,900 cu. ft. of manufactured. The gas utilities are increasingly turning to a therm basis, with one therm equal to 100,000 B.t.u.

Equivalent tables have been worked out showing that distillate at 13 cents a gallon equals gas at 99 cents per million B.t.u.'s At 12, 11, and 10 cents oil equals gas at 91.4, 83.8, and 76.2 cents, respectively. Ten-cent oil also equals coal at $16.70 cents a ton. Oil now ranges considerably under gas in price, and in New York is about 15 per cent under the best grade of coal.

Gas prices being contracted in the field in the Southwest range from 8 to 12 cents per M.c.f. Using the rule-of-thumb of about a cent and a half per 100 miles transmission costs, transportation from Texas to New York is thus roughly 25 cents. This gives 37 cents cost in New York. Giving the distributing utility another 37 cents brings the total price to 74 cents.

This calculation neglects many other factors, including the peak-load problem of residential heating. Administrative expenses in distribution, such as billing and service, are heavy. However, one community north of New York City which is about to receive natural gas is considering a price of 7 cents per therm, or 70 cents per 1,000,000 B.t.u.

Gas at 70 to 80 cents per million B.t.u.'s may be considered the minimum price possible, and in many cases it will range higher. Even though distillate may be some above this, the average householder would not undertake the expense of converting his burning equipment.

Won't take it all.—Natural gas is not expected to reach the New England market until 2 or 3 years hence. All three of the long-distance transmission lines entering the Northeast are now involved in plans to supply this area. Forecasts show that about 200,000,000 cu. ft. daily, roughly equal to about 35,000 bbl. daily of oil in heating equivalent, will be supplied in New England by the end of 1952.

It also has been forecast that 652,000,000 cu. ft. daily of natural gas will be supplied to the entire Middle Atlantic and New England market by the end of 1952. This equals about 110,000 bbl. daily of oil in heating equivalent. These appear to be conservative estimates.

L.P.G. Survey

Sales of liquefied petroleum gas increased last year but the rate of growth has slowed; future outlook good

BARTLESVILLE.—The liquefied petroleum gas industry continued its steady growth of increased sales during the year 1949. It is estimated that during 1949 the total volume of liquefied petroleum gas marketed in the United States was 2,725,000,000 gal. This represents an 8.5 per cent increase over the volume sold in 1948.

The fact that the increase in sales volume during 1949 was 8.5 per cent when increases during the past few years have ranged from 25 to 30 per cent does not in itself indicate that continuing lesser percentage increases in marketed volume can be expected during the next few years.

The per cent increase in 1949 was low because of the mild weather in the winter of 1948-49 in those areas where L.P.G. is used extensively for house-heating and because many new natural-gas transmission lines were placed in operation during the year. Some of the L.P.G. gas used by utilities was displaced by this new supply of natural gas.

E. O. MATTOCKS

K. W. RUGH

This is the year-end review of the liquefied petroleum gas industry prepared annually by two officials of Phillips Petroleum Co., Bartlesville, Okla., R. K. Rugh, manager of the Philgas division, and E. O. Mattocks, technical representative of the chemical engineering department.

Over a period of years we can assume that normal winter temperatures and demand for liquefied gas to augment natural-gas supplies during peak conditions will again create the normal increased demand for liquefied petroleum gas and the industry will again enjoy its traditional large percentage increases.

Highlights

Sales of L.P.G. in 1949 were 8.5 per cent above 1948.

This contrasts with annual gains of 25 to 30 per cent in recent years.

The outlook is for continued and probably more rapid gains in the future.

Domestic use of L.P.G. gained 12 per cent. It now serves 6,500,000 homes not on gas mains.

Industrial uses gained 0.3 per cent.

L.P.G. used in gas manufacture increased 1 per cent over 1948.

Use of L.P.G. as a raw material for chemical manufacture increased 6.9 per cent.

Improved equipment promises expanded use to fuel tractors and trucks.

Domestic use.—It is estimated that the volume of L.P.G. sold for domestic purposes in 1949 reached 1,650,000,000 gal. This represents an increase over 1948 sales of 12 per cent. The demand from present consumers for additional gas appliances and the de-

MARKETED PRODUCTION OF LIQUEFIED PETROLEUM GAS

	Total sales		Distribution (thousands of gallons)							
Year	Gal. (in thousands)	Per cent increase	Domestic[1]	Per cent increase	Industrial and miscellaneous[2]	Per cent increase	Gas manufacture	Per cent increase	Chemical manufacture	Per cent increase
1922	223									
1923	277	24.4								
1924	376	36.0								
1925	404	7.2								
1926	465	15.2								
1927	1,091	134.6								
1928	4,523	314.6	2,600		400		1,500			
1929	9,931	119.6	5,900	126.9	1,500	275.0	2,500	66.7		
1930	18,017	81.4	11,800	100.0	2,200	46.7	4,000	60.0		
1931	28,770	59.7	15,295	29.6	7,172	226.0	6,303	57.6		
1932	34,115	18.6	16,244	6.2	8,167	13.9	9,703	53.9		
1933	38,931	14.1	16,626	2.3	13,987	71.3	8,318	—14.3		
1934	56,427	44.9	17,681	6.3	32,448	132.0	6,298	—24.3		
1935	76,855	36.2	21,380	20.9	47,894	47.6	7,581	20.4		
1936	106,652	38.8	30,014	40.4	67,267	40.4	9,371	23.6		
1937	141,400	32.6	40,823	36.0	62,610	(3)	11,175	19.3	26,792	
1938	165,201	16.8	57,832	41.7	62,694	0.0	12,386	10.8	32,299	20.5
1939	223,380	35.3	87,530	51.4	93,723	49.4	15,435	24.6	26,892	—16.7
1940	313,456	40.2	134,018	53.1	124,482	32.8	20,285	31.4	34,671	29.0
1941	462,852	47.7	220,722	64.7	172,669	38.6	25,255	24.5	44,206	27.5
1942	585,440	26.5	303,857	37.6	197,179	14.2	31,366	24.2	53,038	20.0
1943	675,233	15.3	344,962	13.6	237,396	20.4	37,519	19.6	55,356	4.4
1944	898,071	33.0	445,617	29.2	254,590	7.3	45,879	22.3	151,985	175.0
1945	1,067,979	19.0	533,262	19.7	256,577	0.8	53,849	17.4	224,291	47.5
1946	1,410,370	32.1	738,466	42.2	253,745	—1.1	86,660	61.0	311,499	38.8
1947	2,008,262	42.4	1,150,538	51.7	274,125	8.0	169,332	95.4	414,267	33.0
1948	2,511,160	25.0	1,473,289	28.1	309,269	12.8	237,638	40.3	490,964	18.6
1949	2,725,000	8.5	1,650,000	12.0	310,000	0.3	240,000	1.0	525,000	6.9

[1]Household use plus other requirements by these customers such as irrigation pumping, tractor fuel, flame weeding, chicken brooding, and similar uses. Included also is L.P.G. sold by domestic distributors but used for industrial purposes, internal-combustion engine fuel, and for gas-manufacturing purposes. [2]Includes L.P.G. sold for fueling internal-combustion engines. [3]Not comparable due to segregation of chemical manufacturing.

Remarks: In this table total sales for all years except 1949 were obtained from U. S. Bureau of Mines reports. Distribution for the years 1931 to 1948, inclusive, was obtained from the same source. All other volumes were estimated by the writers. The total sales volume includes all L.P.G. (propane, butane, and propane-butane mixtures) when sold as such. Until 1944 the sale of pentane when sold for any purpose other than motor-fuel blending was included. Since then it has been excluded. It does not include butane when blended with heavier petroleum fractions for motor-fuel purposes. Intercompany sales transactions such as purchases of L.P.G. by one company from other companies and resold as L.P.G. have been eliminated in order to avoid duplication of sales figures. The data do not reflect sales of L.P.G. used directly by the producer at the point of production for fuel polymerization, solvent dewaxing, etc. Neither do the figures include sales of hydrocarbons to plants manufacturing synthetic rubber or aviation gasoline or their components.

PACKAGED FUEL.—6,500,000 homes not on gas mains depend on liquefied petroleum gas, much of it delivered in small, handy containers such as these

mand from new consumers for L.P.G. for cooking, water heating, refrigeration, and space heating was as much in evidence as during any previous year.

The winter of 1948-49 was relatively mild throughout wide areas in which L.P.G. is used for space heating, which resulted in a decrease in demand for the product during the heating season. Nevertheless the increased demand from new consumers, together with the increased year-around demand from existing consumers, resulted in an appreciable increase in total demand for household use of L.P.G.

It is estimated that there are 6,500,000 homes enjoying the use of L.P.G. service in farm and suburban homes beyond gas mains.

Industrial use.—The volume of L.P.G. used in 1949 for industrial purposes, internal-engine operation, and other miscellaneous industrial uses is estimated at 310,000,000 gal. This represents an increase over that consumed in 1948 of 0.3 per cent.

During 1949 many industrial plants turned to L.P.G. for their major source of fuel. In addition, as natural-gas lines were extended, making natural gas available to many industrial plants, some of these plants installed L.P.G. standby installations to serve as the fuel supply during emergencies when the natural-gas supply is interrupted, or during winter months when household and industrial plant space-heating requirements cause curtailment of natural-gas supplies normally available for manufacturing purposes.

The continued demand for L.P.G. for either constant use or standby use indicates a continuing expanded market for L.P.G. to industrial plants.

Utilities.—For gas-manufacturing purposes it is estimated that 240,000,000 gal. were used in 1949. This represents an increase of 1 per cent.

The gas-manufacturing industry uses L.P.G. in smaller communities to make the complete sendout of gas and in the larger communities to augment manufactured or natural-gas supplies during peak-load conditions or to entirely replace manufactured or natural gas during emergency periods. There are approximately 400 gas-manufacturing plants in the country using liquefied petroleum gas as their sole source of supply. In the larger communities where liquefied gas is used to augment supplies during peak-load periods or as emergency standby, the gas companies have installed large L.P.G. storage.

Because of the mild 1948-49 winter the demand on the part of these utilities for L.P.G. was not comparable to other years of normal winter weather. Now that these utilities are again connecting to gas appliances for domestic space-heating and other uses it is anticipated that the winter demands will again increase beyond the capacity of their normal gas-manufacturing facilities or natural-gas supplies. This will create increased demands on the part of the gas industry for liquefied petroleum gas.

Chemical manufacture.—L. P. G. is continuing to be accepted as an ideal raw material by the chemical industry for the production of chemical intermediates. A number of plants under construction or just completed in 1948 have been on stream during most of 1949. It is estimated that the L.P.G. used by chemical manufacturers during 1949 was 525,000,000 gal., which is an increase of 6.9 per cent over that consumed in 1948.

Tractor fuel.—During 1949 the use of L.P.G. for tractor fuel was greatly accelerated. This increased use was brought about not only by the recognition of the economical and mechanical advantages from its use, but also by the development of a low-cost method whereby L.P.G. could be utilized in the conventional carburetion system interchangeable with the liquid fuel for which the engine was originally equipped.

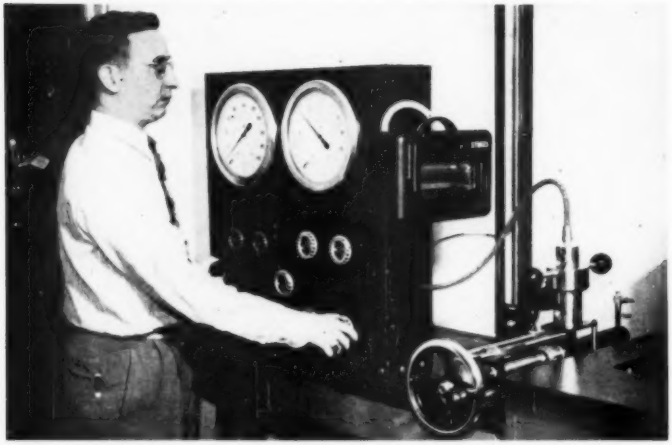
Considerable interest is being shown in the use of L.P.G. to fuel trucks and buses on the highway, and a continuing demand exists for L.P.G. to fuel engines in heavy-duty construction and mining equipment.

Safety.—Interest in safety has continued at a high level during the year. The Interstate Commerce Commission has issued new specifications governing the transportation of liquefied petroleum gas in cargo tanks (truck tanks), and portable tank containers (skid tanks). Likewise, during the year the National Fire Protection Association issued a new set of standards for the design, installation, and construction of containers and pertinent equipment for the storage and handling of liquefied petroleum gases at utility gas plants.

This has been issued by the National Board of Fire Underwriters as N.B.F.U. Pamphlet No. 59. Likewise, the National Fire Protection Association revised standards for the design, installation, and construction of containers and pertinent equipment for the storage and handling of liquefied petroleum gases. This was issued by the National Board of Fire Underwriters as N.B.F.U. Pamphlet No. 58, dated March 1949.

Outlook.—The quantity of liquefied petroleum gas now being marketed classifies this industry as one of the major fuel suppliers in this country. Known reserves and presently available but unrecovered volumes of L.P.G. indicate adequate quantities for the increasing future demands.

MID-CONTINENT



J. P. MacEachern, laboratory technician, prepares samples for oil and water-saturation determination

Core Analysis

Shell's program illustrates trend in reservoir study

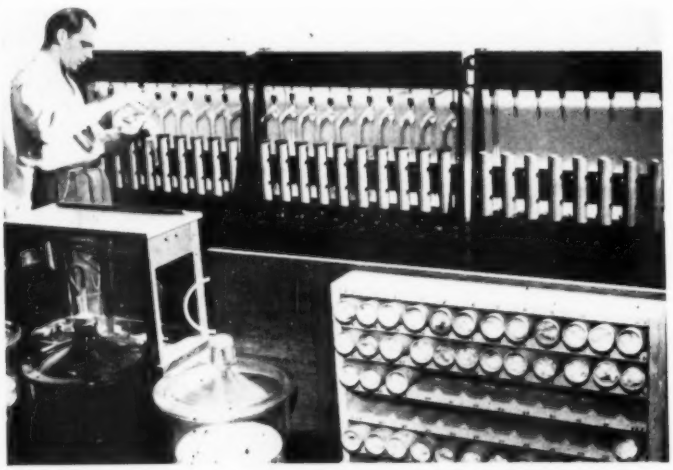
TULSA.—Core analyses are becoming more and more intricate and complete. As an essential aid to successful reservoir study, core analyses are made wherever such tests are possible, and new methods are being devised to achieve accurate analysis of formation cores where more conventional methods will not function.

Typical of many laboratories being established to run core analyses is the new one of Shell Oil Co. in Tulsa. This laboratory is equipped to analyze cores from the Shell operating areas in Illinois, North Texas, Oklahoma, Kansas, Nebraska, and the Dakotas. Active drilling in some of these areas may necessitate additional expansion of the laboratory facilities.

The growth of coring and core analysis is aptly illustrated by the growth of Shell's core laboratory program. The Tulsa laboratory is the first of several belonging to the company's production department. The first laboratory was established here as recently as 1935. Now, however, each area office has a core laboratory, there being one each in Houston, New Orleans, and Midland, as well as Tulsa. Each of these runs core analyses for the use of area reservoir, exploitation, and logging engineers.

The new Shell laboratory was built to accommodate the increased amount of equipment and work required. The expansion of facilities in part was brought on by development of Elk City field in Beckham and Washita counties in western Oklahoma, with a consequent increase in routine core analyses. In addition, demands have been made on the laboratory by work done preparatory to the start of a large water flood in Benton field, Franklin County, Illinois.

Equipment in the laboratory includes such modern core-analysis devices as a mercury capillary pressure instrument, Boyle's Law porosimeter, permeameter, flood pots, and resistivity equipment for approximating formation resistivity factors and obtaining other data useful in interpreting electric logs. All equipment is assembled locally by laboratory technicians. Drill cuttings as well as cores are handled in the laboratory.



R. F. Smith, laboratory supervisor, makes an adjustment to apparatus used to make capillary-pressure determinations

Oklahoma Cuts Allowable

OKLAHOMA CITY. — Oklahoma's reduced crude oil allowable of 365,499 bbl. per day for January represents a 20 per cent production cut in prorated pools and a 10,000-bbl. cut to 35 bbl. per well per day for wells on a minimum status.

The cut in crude allowable is in line with the recent reduction in Texas' production but in contrast with a January allowable increase in Louisiana which permits a record daily production of 572,212 bbl. *(See Gulf Coast).*

Action of the Oklahoma Corporation Commission was taken upon the recommendation of Walker T. Pound, conservation director and most purchasing concerns. The cut amounts to a reduction of 33,056 bbl. from December production. Production from new fields in the state partly counteracted the effect of previously applied cuts in allowable.

MIDWEST

Toledo Completion

Sun plans to put expanded refinery on stream March 1

George Weber

TOLEDO.—The biggest Houdriflow unit now under construction is scheduled to begin initial operation here March 1, becoming the second unit using this process to go on stream in this country.

The new unit, with a rated throughput capacity of 28,000 bbl. daily, is the feature installation in Sun Oil Co.'s huge construction and modernization program at the Toledo refinery.

When the cracking unit and other new facilities are integrated with existing units on a refinery-wide basis, the refinery will be the largest in Ohio and will rank twenty-fourth in the nation.

Sun is nearly doubling its crude capacity, now rated at 37,000 bbl. daily. A new crude distillation unit being installed is rated for nominal operations at 24,000 bbl. per day but can charge as much as 30,000 bbl. This represents a net addition to the plant's crude capacity, as it will be operated in conjunction with existing crude facilities. A vacuum unit, capable of handling 17,000 bbl. daily of reduced crude charge also is nearing completion.

Also included in the project are a gas-recovery system and a catalytic polymerization unit.

Auxiliaries to the modernization program include new steam-generation facilities, a new electrical substation, 500,000 bbl. in new tankage, and numerous buildings serving the process units, and maintenance, warehouse, and office facilities.

Expected yield.—With an ultimate operating capacity for 64,000 bbl. per day, the revamped Toledo refinery will show both increased efficiency and added flexibility. It is estimated that gasoline production will be raised to average 55-60 per cent of crude charges with an even higher yield possible at lower throughput rates. Accordingly, residual fuel output will be reduced, to a possible minimum of 10-12 per cent of crude charge, including asphalt manufacture. The new atmospheric crude unit will run to about 30 per cent bottoms fraction, depending on types of crude run. The vacuum unit will take reduced crude from both new and existing units to run to about 10 per cent bottoms. This additional vacuum distillate will add to feed stock for catalytic cracking. Much flexibility in over-all operations will allow runs to conform to varying demands for products.

Crude supply.—Added crude demands for the new refinery will be met by runs of the Mid-Valley Pipe Line, the new 1,000-mile, $56,000,000 project nearing completion by Sun and Sohio. Crudes delivered to the Mid-Valley terminus at Lima, Ohio, will be moved to Toledo by the Buckeye Pipe Line. These crudes will include some from Delhi, La., where Sun has substantial production, and other crudes from the Louisiana and Texas Gulf Coast.

The new cat cracking process was developed jointly by Houdry Process Corp. and Sun Oil Co. Catalytic Construction Co., a Houdry subsidiary, handled purchasing, expediting, and field construction on the project. Process Engineers, Inc., designed the gas-absorption and gasoline-stabilization unit, and Fluor Corp. designed the gas compression unit.

ECONOMICS

Business Forecast

Prognosticators agree first half of 1950 will be good; third and fourth quarters given cautious, or no, comment

John C. Casper

BUSINESS forecasters, by and large, have not been very bold in predicting the course of industry during 1950.

Most agree that for the first half of the year the prospects are for high industrial activity and good business conditions. But when it comes to the last half they get rather vague or fail to mention it at all.

Because the outlook for the petroleum industry depends so largely on general business activity, there are presented here the highlights of some of the year-end forecasts.

General.—In a review of 1949, Charles Sawyer, Secretary of Commerce, said: "The new year will start with a volume of business activity not materially different from the high rate which prevailed in the second half of 1949."

Business conditions for 1950 as a whole are expected to be moderately below 1949, with the second half of the year slightly lower than the first. There are two special boosting influences tending to stimulate business in the early months of the year:

1. The gap in business inventories from last summer's period of depletion has not yet been filled. The process of rebuilding these inventories will keep production above demand for the first few months of the year.

2. National Service Life Insurance dividend payments to veterans will be concentrated in the first part of the year. These payments will amount to almost $3,000,000,000.

During 1950 we will spend about $3,250,000,000 on European aid and probably about $250,000,000 on public housing.

On the other hand, these plus values may do no more than balance the drop in capital expenditures. Estimates of business capital outlays during the first quarter of 1950, made jointly by U. S. Department of Commerce and the Securities Exchange Commission, amounted to $3,800,000,000. This represents a drop of 13 per cent from the first quarter of 1949 and almost 30 per cent from the postwar peak in the last quarter of 1948.

Petroleum.—All reports and estimates by petroleum industry economists agree that demand for petroleum products in 1950 will be greater than it was in 1949. As is to be expected, the estimates of the amount of the increase vary, but in most cases the forecasts call for gains ranging from 3 to 5 per cent.

Concerning the industry's prospects for 1950, Robert G. Dunlop, president of Sun Oil Co., stated, "The industry has developed sufficient facilities to handle postwar increases in demand for its products. At the same time, contributing factors have been a reduction in exports of both refined and crude oils, an increase in imports of crude oil, and unusually mild weather last winter and so far this season.

"In all other respects the outlook is most satisfactory, unless current economic conditions are upset by government policies that would again set in motion an inflationary spiral or otherwise hamper free market operations."

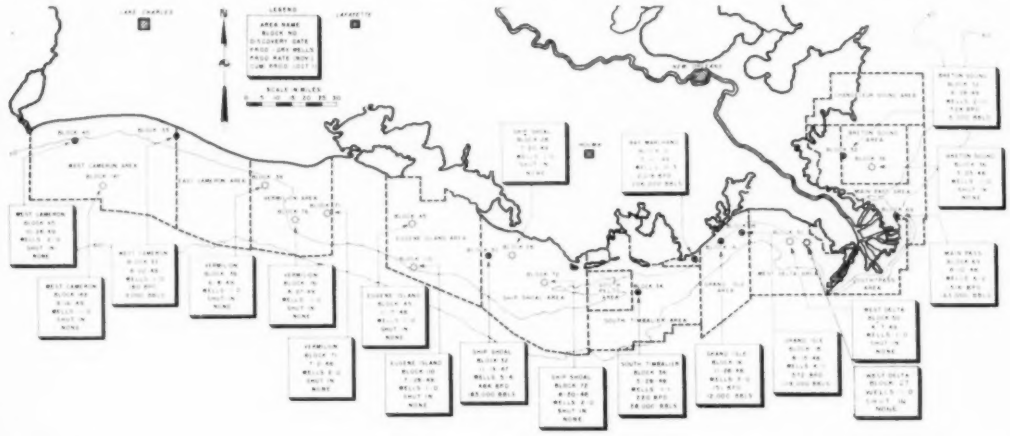
Steel.—The steel industry had its third largest output for peacetime uses in 1949 and has made a strong start for 1950, according to Walter S. Tower, president of American Iron and Steel Institute.

It is estimated that over 1,000,000 tons of ingots were lost in the recent strike. If demands hold to prestrike levels, it will take until the middle of the year to make up this tonnage, even at capacity operations.

The slightly dark cloud on the horizon is the impending loss of most of the export markets because of foreign currency devaluation and the increase in steel capacity in other countries.

Automotive.—According to the Automobile Manufacturers Association, dealer stocks of new cars hit the lowest point of the year in the final month of 1949, and as a result many manufacturers have increased their early 1950 production schedules. Many industry officials are optimistic that 1950 production will equal or top that of 1949. Annual replacement requirements for cars and trucks, estimated by the association, is now about 1,200,000 units greater than it was before the war.

C. E. Wilson, president of General Motors Corp., said: "The automotive business will still be good in 1950. The demand created by lack of production during the war has not been satisfied. The basic market is importantly greater than it was before the war, perhaps as much as 25 per cent. There are millions of worn-out cars on the road today because new ones are not available."



Offshore Loss

Industry now recovering but $1 for $10 invested in Gulf

Leigh S. McCaslin Jr.

HOUSTON.—The "oil-rich tidelands" is a phrase tossed about loosely by politicians in the current struggle of the federal Government to wrest ownership from the states.

But analysis of the results to date shows that offshore oil development is strictly a losing proposition.

Currently the oil industry is getting back only $1 for every $10 spent in offshore exploration and development work along the Gulf of Mexico.

Off the coast of Louisiana, below the low-tide mark, the industry currently is spending about $60,000,000 per year and getting oil at the rate of 2,000,000 bbl. annually. At a price of $2.80 per barrel of crude this is a return of about 10 per cent.

Nine oil fields have been discovered, but they are producing only 5,500 bbl. of oil per day in total. This is only about 1 per cent of the entire oil production of Louisiana. Eleven gas or gas-condensate fields have been discovered off the coast, but because there is no way to get the gas and its liquid content ashore they are all shut in and the return to the operators is nil.

The Louisiana area is the only strictly offshore oil operation. No commercial discoveries have been made off Texas or other states along the Gulf, and California's submarine fields are produced by directional drilling from the beach.

The Louisiana experience has demonstrated that offshore oil development costs three times as much as comparable operations on land. The actual cost of drilling a well may be about the same, but the total expense is trebled by the necessity of building a drilling platform on the ocean bottom and of marine transportation of equipment and drilling crews.

After a discovery has been made it costs at least three times as much to produce the oil as on land, and in some cases several times this amount. The oil must be taken to shore terminals in barges, and bad weather interrupts the operation about 25 per cent of the time.

The oil industry has been willing to spend huge sums for small immediate returns in offshore work because it hopes that new methods will be developed to reduce costs and increase output. To this end, studies are now being made on such devices as submarine pipe lines which would take oil and perhaps gas and gas-condensate to onshore treating plants, aerial tramways to convey equipment, personnel, and perhaps oil between land and the offshore platform, and electrification of the well platforms by submarine cables.

The accompanying map shows the results of Louisiana offshore operations to date. Oil fields are shown as black dots and gas and gas-condensate discoveries as open circles. It is based on a report to the Interstate Oil Compact Commission by A. L. Vitter, Jr., of The California Co. to which has been added data on the most recent discovery, a gas-condensate well in Block 27 of the West Delata area.

Offshore Interests Sold

DALLAS.—A substantial interest in one of the largest offshore operations in the Gulf of Mexico has been sold by Magnolia Petroleum Co. to Continental Oil Co.

An interest in the same operations was also purchased from Magnolia by Newmont Oil Co.

Cash involved in the sale, the percentage of the interest, or the exact properties affected were not disclosed. It was announced, however, that the transaction involves three gas discoveries and extensive acreage, including a number of untested prospects. Five wells are now being drilled, two development and three wildcat. Shows have been found in two of the wildcats, but they have not yet been tested. Magnolia will remain operator of the wells.

Magnolia's operations in the Gulf last spring included an area of nearly 250,000 acres off the Louisiana coast, leased at an average cost of $5.35 per acre and a bonus of $1,335,887.21.

The purchases by Continental and Newmont have been made effective as of October 1, 1949, and have the approval of the Louisiana State Mineral Board.

Record Louisiana Output

BATON ROUGE.—Louisiana's 1949 crude production will be the highest in history, and the state will enter 1950 with a record high daily allowable, according to Conservation Commissioner S. L. Digby.

Total production for the past year will be very close to 200,000,000 bbl., or 7 per cent more than in 1948, Digby estimates. The daily allowable for January is 572,212 bbl. as compared with 563,157 bbl. for December.

The commissioner stated that the new record production figure was reached despite considerable curtailment because of decreased demands for domestic crude. Cutbacks in production for 6 months of this year, Digby said, resulted in a reduction of approximately 24 per cent in crude-

oil storage from the second-quarter figure.

"Had the demand for domestic crude this year been as high as in 1948, our production would have been substantially higher," Digby added. Other 1949 developments reported by the Louisiana commissioner included the discovery of 37 new fields and the abandonment of 115 producing wells.

Salt Mountain

Bay Marchand salt dome one of world's largest

HOUSTON. — Geologists estimate that as much as 56 cubic miles of salt is contained in the huge piercement-type salt dome underlying The California Co.'s Bay Marchand offshore leases.

Structural information obtained to date also indicates that the Bay Marchand dome is one of the largest structures of this type in the world. The California Co. is producing 2,500 bbl. of oil daily from wells drilled in this Louisiana offshore area.

Presence of the dome was first discovered in 1927 by a refraction-seismograph survey, and an unsuccessful test was drilled on shore to a depth of 6,380 ft. in 1930 as a result of the survey. In subsequent years, nine more wildacts were drilled around the dome with eight failures and one gas well resulting. All but one of the wells were onshore locations.

In 1947, The California Co. became interested in the area as the result of offshore reflection seismograph work. So on Feburary 17, 1948 the company leased 13,000 acres of offshore area from the State of Louisiana for approximately $1,000,000. Three drilling platforms were then erected and work commenced.

The first test resulted in a dry hole, but it hit the top of the salt dome as planned and helped correlate subsurface study. Initial wells on both of the other platforms hit pay sand. The discovery well was brought in on March 3, 1949 with pay at 2,873-92 ft. The test was located about 2½ miles offshore from the mouth of Bayou Lafourche in Lafourche Parish.

Ten oil producers have now been completed in Bay Marchand field. In addition, two dry holes have been drilled since the original wildcat duster. The company is currently drilling two development wells on the north edge of the shallow, prolific west-flank producing area. Plans are under way to drill a medium-depth wildcat on the east flank of the dome, where salt is expected at approximately 6,500 ft.

SOUTHWEST

Old Field Expands

40 wells added to Monroe gas field to boost output

SHREVEPORT.—To augment its supplies of natural gas in 33-year-old Monroe field of northern Louisiana, United Gas Co. recently completed a drilling program adding 40 new gassers. As a result, the company has available an additional 40,000 M.c.f., or more, daily of natural gas to assist in caring for the heavy winter demand.

The extensive drilling program was started last April, with the last of the 40 producers being completed December 14. Most of the gassers, ranging in depth from 2,100 to 2,230 ft., were drilled on land owned in fee by companies of United Gas. Although drilling time was only 3 or 4 days per well, actual completion time was somewhat prolonged because each well was acidized with 3,000 gal. to improve its productivity.

On initial open-flow tests most of the 40 new producers gaged between 3,000 M.c.f. and 5,000 M.c.f. daily; 12 were gaged at better than 5,000 M.c.f. and one tested 7,760 M.c.f. daily. Total open-flow capacity of the producers is estimated at 165,000 M.c.f., but actual withdrawals probably will average close to 1,000 M.c.f. daily.

In the 33 years which have passed since the discovery of Monroe field, it has produced more than 4½ trillion cubic feet. Although reservoir pressures are well below the original 1,030-psi. rock pressure, some 1,500 gassers are still producing in the 200,000-acre field.

The field's principal gas reservoir is extremely tight so that little gas migration occurs; for that reason it remains a good source of gas in spite of its age. The field also has had a comparatively slow development. By 1925 only 390 wells had been completed and the number did not pass the 1,000 mark until around 1935.

Location of electrical and other industries in the South caused large pipe lines to fan out from Monroe—pipe lines that marked the beginning of long-distance gas transmission. By 1930, Monroe gas was moving to New Orleans, Atlanta, Memphis, St. Louis, and as far west as Dallas and Fort Worth.

Later, as reserves decreased from year to year and other large gas fields were being opened in Louisiana and Texas, the flow of gas was reversed in many of these old lines. Gas from Texas and the tri-state area began to pass through Monroe on eastward; other lines moved gas from new fields in Coastal Louisiana and Texas to the Monroe gas center and on beyond. Thus, while the field no longer ranks as a major reserve, it still remains the hub of a vast network of gas-transmission lines.

Crude Price Cut

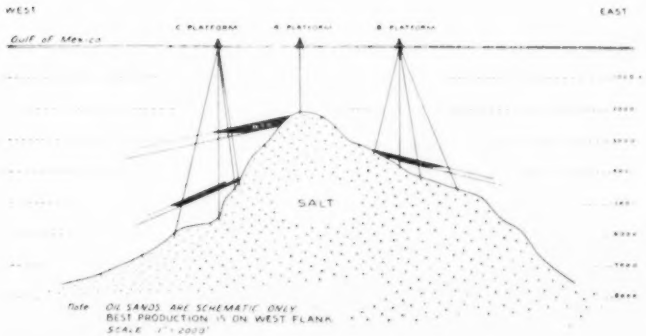
DALLAS.—Termed an adjustment necessary to bring West Central Texas crude prices in line with those of Scurry County, Onyx Refining Co. of Abilene announced a 7-cent cut in its posted prices Monday.

The reduction is from $2.65 to $2.58 per barrel for 40 gravity and above with proportionate cuts for lower gravities. No other purchasers announced similar cuts immediately.

Vice President Jack Levering said change was necessary because Scurry and West Central crudes are almost identical in quality but that the former was priced 7 cents cheaper. Some 30,000 bbl. of Scurry crude daily is being marketed in the Middle West, where Onyx markets its products, Levering said.

The reduction affects some 12,500 bbl. of crude daily, mostly from fields in Jones County. Principal fields there, and the approximate amount bought by Onyx daily are: Bartlett, 2,400 bbl.; Hardy, 950; Sayles, 500; Wimberly, 2,600 bbl. In Taylor Coun-

BAY MARCHAND SALT DOME



ty, Onyx also takes about 1,000 bbl. daily from Gibson, and about 2,100 bbl. from Reddin field. Onyx operates a small refinery at Hawley which has a crude charging capacity of 4,000 bbl. daily.

Oil-Tax Boost?

Survey shows 4 of 10 Texas legislators favor increase

HOUSTON.—Four out of every 10 members of the Texas legislature favor increased taxes for the oil and gas industry as a means of balancing the state's budget.

Such is the conclusion reached by William H. Gardner of the Houston Post as a result of a letter survey. He received replies from more than one-fourth of the legislators when he queried them on the state's financial difficulties.

Gov. Allan Shivers is expected to call a special session for January 31 to provide money for the state's eleemosynary institutions and to take care of an expected deficit for the coming year. Estimates of the money required range as high as $100,000,000. Declining oil production is responsible for a major portion of the deficit.

In the Post survey, one out of three legislators favored a broadening of the 1941 omnibus tax bill. This bill has been described as "a selective sales tax" and levies varying taxes on 18 different items. Oil and gas provide the major portion of the revenue under this bill. One out of 10 of the senators and representatives queried favored new taxes against natural resources only. In Texas, of course, natural resources means primarily oil and gas. Sulfur, carbon black, and cement are the only other natural resources which are taxed at the present time.

One-fourth of the lawmakers replying to the Post's survey put themselves on record as favoring no increase in taxes. A number of proposals for settling the state's difficulties were set forth by this group. Reduction in appropriations already made was the most popular solution. Sale of state land, bond issues, and investment of surplus money were other proposals.

Attack on Imports

HOUSTON.—A three-pronged attack on crude imports is being made by the Texas Independent Producers and Royalty Owners Association.

Meetings are being held in each Texas congressional district at which each Texas congressman is urged to support a limitation on imports. Secondly, letters are being sent to congressmen outside of Texas calling attention to the problem. Thirdly, an informational pamphlet is being mailed to TIPRO's 4,500 members.

WATCHING WASHINGTON

Bertram F. Linz

Antiimport Enlistments

Independent producers fighting to secure limitations upon the imports of oil have been given the support of "thousands" of individual independent business and professional men, members of the National Federation of Independent Business, it was disclosed by the federation this week.

These men—how many thousands not mentioned—have called on their congressmen to stop federal spending that is aiding in the construction and maintenance of oil refineries in the Near East, and have demanded that Congress limit oil imports into the United States if it is found that they are endangering the national security by discouraging the discovery and development of new domestic reserves and if it is found that the flow of foreign oil is causing ruination of tax-paying domestic independent oil producers.

A poll of its membership, the federation said, showed that 76 per cent of those voting were opposed to the use of tax money for refineries on the Russian border, 63 per cent were for limits on oil imports to insure our military security, 69 per cent were against unlimited imports, and 66 per cent favored the imposition of an import quota.

Antitrust Stirrings

In an effort to resuscitate the long moribund "Mother Hubbard" suit, Sen. Burnet R. Maybank recently sent over to the Justice Department a large file of material on oil prices and oil-company practices gathered in the course of an investigation by his banking and currency committee, but there is no indication that the department will be spurred to immediate action.

Sen. Guy M. Gillette of Iowa also has been interesting himself in the old oil case, and at recent hearings before his agriculture subcommittee last month questioned Herbert A. Bergson, head of the antitrust division, on what the department was doing.

The Maybank file is being considered in the department, but all idea of pressing the original prewar suit has been abandoned for a number of reasons, one that "mass trials" are unwieldy, expensive, and far from effective.

Suits and threats of suits have kept the industry jittery over a number of years, yet Bergson told Gillette's subcommittee that between 1906 and 1947 only 22 cases were instituted by the department which involved petroleum. Of these, 17 involved monopoly, misuse of patents, price-fixing, illegal jobber licensing, cartel agreements, and exclusive dealing contracts, and the remaining 5 were brought under the Elkins and Interstate Commerce acts.

Socking the Motorist

Forty-four state legislatures met last year, and before they adjourned 16 of them increased state gasoline taxes.

But increases proposed in another 17 states were defeated, and the increases made by 3 states are subject to approval in referendums to be held this year.

The increases in rates ran from ½ to 2 cents per gallon, with the higher figure proposed in nine states but accepted in only three. One state adopted a 1½-cent increase and 10 states had a 1-cent rise while another 10 turned that figure down. Two legislatures enacted a ½-cent increase, while another turned it down.

Higher gasoline taxes, however, were only one of several ways in which the various states increased their take from automobile and truck owners. Thirteen states and the District of Columbia made changes in license tax structures, the trend unmistakably being toward additional or increased rates.

Out on a Limb

The ambitious synthetic-fuels program of the Bureau of Mines is left out on a limb by the announcement of Standard Oil Development Co. and Pittsburgh Consolidation Coal Co. that they have abandoned plans for commercial production of liquid products from coal. After spending a lot of money on both technical and economic research, the companies concluded that there is too much gasoline available to leave room for synthetic fuel and that the cost of coal is so high and the supply so unreliable as to make investment in synthetic plants extremely hazardous.

It remains to be seen whether the Interior Department will continue to press for large federal appropriations to build big coal-to-oil plants which for the past several years it has been representing as the only protection against an almost imminent oil famine.

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Hopes for Compromise

Non-British oil companies alarmed over drastic effects of imports ban; delay in effective date of order possible

Dahl M. Duff

NEW YORK.—Further concern, along with hopes for some compromise solution, were expressed last week in American oil-industry circles over the drastic and widening restrictions against dollar oil in the sterling area.

Reports from Venezuela were that both government and company officials in that country are alarmed over the possibility of a sudden reduction in shipment of products from Venezuelan oil to the United Kingdom.

In this country, officials of the affected companies, those with large-scale foreign operations, presented their case to Washington where the situation is being reviewed in joint British-American oil discussions.

Though there were some unofficial reports the British had decided to hold up implementation of the new import policy for a month or so, one informed official said the only concession thus far made by the British had been a recognition of the difficulty of halting immediately and on such short notice all imports of fuel oil from dollar producing areas. He pointed out tanker schedules had to be changed, and refinery runs altered. The one-third reduction in motor fuel can be worked out in the last part of the quarter.

Like other American oil-company officials, this executive said the British action was a threat to the continued existence of American trade of all kinds. Oil, he said, is merely the first commodity which the British intend to take over, and he added that the British are determined to hold a dominating position in the oil trade in foreign areas.

Japan, too.—Latest concrete development was notification to American companies marketing in that country from their representatives in Japan that the British Exchange Control had refused free trading in sterling for crude oil in that country.

The sterling-dollar oil conflict has been shaping up in Japan for several months. Earlier in the year the Allied occupation authorities decided to allow reopening of the Japanese Pacific Coast refineries which were shut down in 1946, and the crude in question is for the supply of these plants.

Like most of the rest of the world, Japan is short of dollars but has sterling from sales to the sterling area. The American companies were ready to take this sterling and work it off through exports out of Japan to dollar or nonsterling areas.

British authorities notified officials in Japan that American companies could sell for sterling only if the oil came from a sterling source and then only if the sterling so received was used to purchase Japanese goods for export to the sterling areas. In New York, one official commented this meant an American company would pay free sterling for British oil and then come out of the transaction with a frozen sterling balance in London.

California-Texas Oil Co., Ltd., directed its representative in Japan to insist on the right to quote on oil from dollar sources with payment in yen or sterling which may be used to buy Japanese goods for payment in dollars without restriction.

The crude oil for Japan amounts to an estimated 30,000 bbl. daily over the next quarter. Already reported purchased is 960,000 bbl. of crude from a West Coast company. "Special considerations" as to currency were said to have been involved in this smaller transaction.

Squeeze.—The announcement of the British Ministry of Fuel and Power has been interpreted as another step in squeezing American supplies out of Eastern Hemisphere markets. The British Government said it was necessary because of the dollar shortage. Reports were that dollar motor-fuel imports would be cut a third and fuel oil imports from dollar sources eliminated. Curtailments of American-controlled oil imports have been disclosed elsewhere in the sterling area.

Principal line of protest has been directed at the fact that the British authorities have taken no action on American-company proposals under which they would place themselves under British financial regulation and thus gain the right to deal in and use sterling. Although the British equipment industry cannot meet fully the needs of the British companies themselves, the American concerns plan to supply themselves insofar as possible from the sterling area.

The British action to replace American-produced imports with surplus sterling products will affect particularly the Caribbean area. Of imports into the United Kingdom during October of the four principal products, about 88,000 bbl. daily, or 46 per cent, came from the Aruba and Curacao refineries in the Netherlands West Indies. These operate on Venezuelan crude. Smaller quantities were imported from other areas in the Caribbean. October imports are summarized in the following table (figures in 1,000 imperial gallons):

	Total	From N.W.I.
Motor fuel	96,864	48,495
Kerosine	40,329	23,034
Gas oil	20,819	9,809
Fuel and diesel oil	48,453	13,668
Total	206,465	95,006

Of 617,000 bbl. daily refining capacity on the two islands, 390,000 bbl. daily is controlled by Standard Oil Co. (N. J.), and the remainder by the Royal Dutch Shell, a sterling producer.

MIDDLE EAST

Egyptian Company Formed

An all-Egyptian company, the National Petroleum Co. of Egypt, has been granted a concession over 267,000 acres in the country and plans to start drilling before the middle of the year, according to an announcement made in Cairo.

Torcom Papazian, managing director of the company, is planning to visit the United States and Europe soon to obtain equipment for the undertaking. He said the company was considering offers from American, French, and German firms for its purchases, which will amount to between $4,000,000 and $5,000,000.

The company was founded last March with a nominal capital to be increased later as necessary. It has no connection with United States or other non-Egyptian interests. The area to be explored is on both sides of the Gulf of Suez and on the Sinai Peninsula, and other operations will be carried out at Sollum, near the northwestern frontier of Egypt, and also in the Fayoum area, north of Cairo.

The three foreign companies operating in Egypt have raised production to about 44,000 bbl. daily as a result of discoveries on the Sinai Peninsula. However, about a year ago Egypt drew up new mining lease regulations which the companies found virtually unworkable. Standard Oil Co. of Egypt subsequently suspended its exploration program.

Refinery Shut Down

The 83,000-bbl. daily capacity plant of Consolidated Refineries, Ltd. (Anglo-Iranian and Shell) in Haifa, Israel, has again closed down because of difficulties with a crude supply.

The refinery has been operated the last 2½ months at a much reduced

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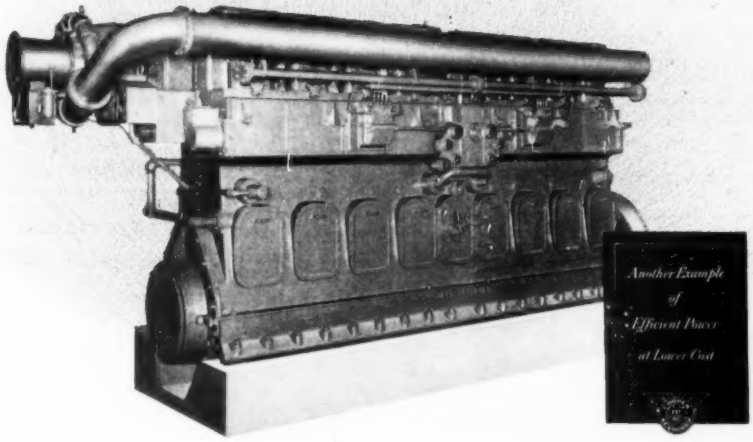

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rate, using crude oil imported by Shell from Venezuela. It closed again late in December, and a report from Haifa said the decision was taken because of the difficulty of continuing shipments of crude from South America which have been paid for in dollars. There appears to be no prospect for another attempt at reopening.

Earlier in December, the Lebanese Government notified the British minister that it would not permit movement of crude from the Tripoli terminal to Haifa. Normally the Haifa plant receives crude from Iraq through a 12-in. pipe line. It was first closed in April 1948 when the Iraquis refused to allow further shipments through the line in view of the Arab-Jewish hostilities.

LATIN AMERICA

Brazil's Plans

Bahia refinery completion to highlight 1950 activity

TWO wildcat tests, one in the Amazon Delta and the other in the Maranhao-Piauhi basin, and completion of the Bahia refinery are the key goals of the oil development program in Brazil in 1950.

Gen. Joao Carlos Barreto, president of Brazil's Conselho Nacional do Petroleo, reviewed these plans in New York prior to his departure last week for Rio de Janeiro after an extended visit in the United States.

The most important of the exploratory wells will be that in the Amazon Basin on the mainland near the mouth of the Rio Tocantins. General Barreto said a heavy rig capable of 15,000-ft. depth has been bought for shipment to Belem, and it is hoped to spud the well by March. Geophysical and geological work in the area of Marajo Island has been promising.

Plans also call for drilling some time during the year on the other wildcat in the sedimentary area along the border of the states of Piauhi and Maranhao. Another lighter rig is to be bought for this project. General Barreto said studies also will be continued in the northeast coastal belt in the states of Sergipe and Alagoas, and preliminary work will be done on the Parana basin in southern Brazil.

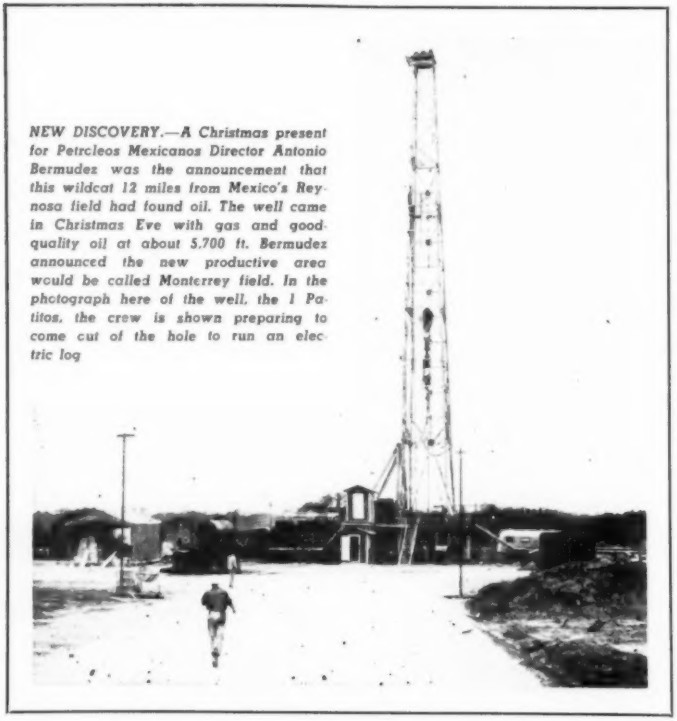
Work began about 2 months ago on the 2,500-bbl. daily refinery in Bahia, and it is hoped to have the plant in operation by the end of the year, General Barreto said. The refinery will process Brazil's present production from several small fields in the Bahia area.

These fields now have reserves estimated at 25,000,000 bbl., and the effective daily production is placed at about 7,000 bbl. with a potential several times this. A total of 120 wells have been drilled in the Baria area, General Barreto said. The conselho has 10 rigs with about 7 in operation at any one time.

Santos has been chosen as the location of the 45,000-bbl. daily refinery which the conselho is planning to build to run on imported crude, the general said. Contract for the refinery has been made with Panamerican Hydrocarbon Research, Inc., but because of Brazil's dollar shortage, much of the equipment will be bought in France from Lille & Schneider. It is estimated about 15 per cent of the materials will necessarily have to be bought in the United States.

Actual site of the plant will be at Cubatao about 6 miles from the origin of the projected Santos-Sao Paulo products pipe-line system.

Since leaving Brazil, General Barreto said he had been informed that the Brazilian Council of National Security had approved the construction of two other refineries projected in Brazil. Concessions for these have been given by the government, one for 20,000-bbl. daily capacity at Sao Paulo and the other of 10,000 bbl. daily at Rio de Janeiro. The action of the council gives these projects a priority rating.



NEW DISCOVERY.—A Christmas present for Petroleos Mexicanos Director Antonio Bermudez was the announcement that this wildcat 12 miles from Mexico's Reynosa field had found oil. The well came in Christmas Eve with gas and good-quality oil at about 5,700 ft. Bermudez announced the new productive area would be called Monterrey field. In the photograph here of the well, the 1 Patitos, the crew is shown preparing to come out of the hole to run an electric log

EUROPE

Hungarian Nationalization

The Hungarian Government decreed nationalization of virtually all its industry last week, but in New York, Standard Oil Co. (N. J.) officials said it was only "an official step" in taking over properties which were seized in September 1948.

Jersey Standard is now completing work of evaluating its Hungarian operations, and the data will be placed in the hands of the State Department in Washington. The company fixes the total at more than $50,000,000, not including war damages for which claims have been filed.

The Hungarian minister of state said former owners of nationalized industry will be compensated. The minister declared that foreign imperialists had used foreign business to build up a spy ring and for sabotage purposes.

Maort (Magyar Amerikai Olajipari Reszvenytarsasag), through European Gas & Electric Co. was the Jersey company's Hungarian affiliate. It made the first discovery in Hungary in 1937 and developed the industry in that country. Reentering after the war, Maort officials encountered increasing interferences from Communist authorities. This culminated in the arrest and imprisonment of two American executives, Paul Ruedemann and George Bannantine, with the government taking over Maort management. Purported confessions signed by the two were repudiated after their release from Hungary.

Steps Up

Follis named chairman of California Standard board

R G. FOLLIS, vice chairman of the board of directors and formerly president of Standard Oil Co. of California, has been elected chairman of the board, succeeding H. D. Collier, who announced his resignation last week.

Joining the firm in 1924 as a refinery engineer, Follis has served on the company's board of directors since 1942. He was made a vice president in 1942 and served in that capacity until 1945, when he was named president. He was named vice chairman of the board of directors in 1948.

Among other duties, Follis directed wartime refinery expansion for California Standard, and then the postwar development of research and the conversion of the company to peacetime operations. For the last 2 years he has been closely identified with Standard's East Coast and foreign operations, including the firm's interests in the Middle East.

He first joined California Standard in 1918, but later left to finish his schooling. He graduated from Princeton University in 1924, and 3 months later he rejoined the company and has served continuously since. He was later made assistant superintendent of the company's Bakersfield, Calif., plant, and in 1928 was made superintendent of the Pasotex plant at El Paso.

H. D. Collier announced his resignation last week as chairman of the board of directors of Standard Oil Co. of California. He has been succeeded by **R. G. Follis,** formerly vice chairman of the board, but will continue as a director of the firm and chairman of its finance committee. In announcing his action, Collier said: "As chairman it has been my long-term program, in which the board has concurred, to be relieved of operating responsibilities and to turn them over to younger executives as they have been developed. I believe the time has now come when this can be done." Collier joined the company in 1903 as a salesman. He has been a director since 1924 and became vice president in 1931. Elected president in 1940, he was named chairman of the board in 1945. **T. S. Petersen,** elected president of the company in January 1948, will continue in that office.

H. D. COLLIER

Vernon E. Frances and **John J. Aires** have been named foremen at Esso Standard Oil Co.'s Baltimore refinery. Francis has been with the firm for 23 years, and previously served as detailer and gageman in the cracking coils department of the refinery. Aires started with the firm in 1924 and has served as substitute foreman.

Sidney H. Hoard, formerly maintenance mechanic at Centralia, Kans., for Panhandle Eastern Pipe Line Co., has been named assistant chief engineer at Greensburg, Kans. He has been with the firm 13 years and formerly was an engineer at the firm's Olpe, Kans., station.

Clayton W. Nygaard, assistant superintendent of producing operations for Standard Oil Co. (Ohio), at Russell, Kans., has been named superintendent of operations for the Shreveport, La., district. **Floyd J. Rosenlieb,** formerly field production superintendent, West Edmond Hunton Lime Unit, Edmond, Okla., has been named superintendent of production for the company's newly reorganized Evansville, Ind., district. **Hubert S. Barger,** engineer; **Paul G. Luckhardt,** field engineer; and **Carl G. Doolen,** chief clerk, all of the Centralia, Ill., office, have been transferred to the Oklahoma City office. **Homer N. Grim,** gas-plant operator for Sohio Petroleum Co., subsidiary of Standard of Ohio, has been transferred from the Coldwater field in Michigan to the West Edmond field in Oklahoma. He has been replaced in Michigan by **Bruce A. Hanlon.**

John H. Bevel, manager of Canadian operations for Gulf Oil Corp., has returned to Calgary after completing a special assignment for the company in New York City. During his absence **Henry H. Bedford,** land and lease department, Gypsy division, served as acting manager at Calgary.

J. M. Hinman, general superintendent of the Pennzoil Co.'s refinery at Oil City, Pa., has been transferred to the general offices as manager of research and development. **A. V. Hoffman,** formerly assistant superintendent, succeeds Hinman as general superintendent of the refinery. Other changes within the company include: **R. S. Lockton,** named manager of the newly created western division, with headquarters in Kansas City, Mo.; and **R. K. Peppard,** named division manager of the newly established southwestern division at Oklahoma City. These two divisions were formed by division of the company's old western division.

A. A. Cohn, chief chemist for El Paso Natural Gas Co. at Jal, N. M., has been named division engineer of the Jal district, and **Paul Trout,** formerly a chemist in the division, has been appointed chief chemist replacing Cohn. **C. E. Emmerson,** formerly chief maintenance mechanic for the company, has been named assistant plant superintendent at Eunice, N. M.

A. A. COHN

PAUL TROUT

H. V. Tygrett, Atlantic Refining Co., has been installed as president of the Dallas Geological Society. Other new officers installed to serve during 1950 include: **H. J. Morgan, Jr.,** Atlantic Refining Co., vice president; **Wallace Ralston,** Sun Oil Co., secretary - treasurer; and **John T. Rouse,** Magnolia Petroleum Co., retiring president, and **Gilbert P. Moore,** consulting geologist, named to the executive committee.

Dean M. Fox has been named district superintendent for General Petroleum Corp. in the Rocky Mountain area, where he will supervise drilling and production activities. He has been with the firm 13 years and has been

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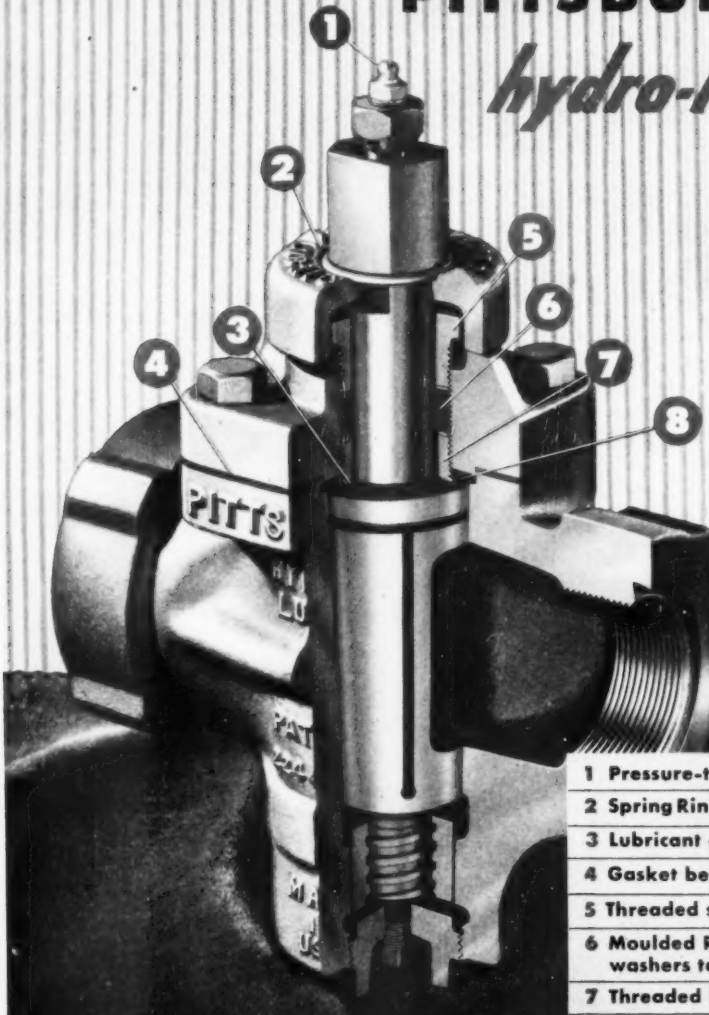

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G. H. SUPPLE

George H. Supple, manager of the pipe-line department of General Petroleum Corp., Los Angeles, has been named vice president and director of pipe lines for the company, succeeding **J. L. Martin,** who retired on January 1. Supple has been with General Petroleum for more than 25 years, and joined its pipeline department in 1935 as assistant to the manager. He was named manager of the department in 1948. Martin joined the firm in 1913 as assistant pipe-line superintendent. He was named general superintendent in 1932 and vice president and director of pipe lines in 1948.

Joseph A. Costello has been elected vice president of Ethyl Corp., New York. He has been with the firm for more than 25 years and has served as assistant general manager of manufacturing for the past 5 years. For 2 years during World War II Costello was on leave of absence from the company as special assistant to the director of refining in the Office of Petroleum Administration for War in Washington, D. C.

C. A. Yeatman has been named chief mechanical engineer for Shell Oil Co. at Los Angeles succeeding **J. R. Gignoux,** who retired on January 1 after 32 years of service with the company. Yeatman formerly worked in the Los Angeles office as a field engineer, and from 1941 to 1948 was assistant manager of marketing operations in the San Francisco office. For the past 18 months he has been with Shell Pipe Line Corp. in Houston. Gignoux supervised construction of Shell's pipe lines from Bakersfield to the Martinez, Calif., refinery, and from Ventura to the Wilmington, Calif., refinery during his company service. He was in charge of construction of the toluene, alkylation, catalytic cracking, and gasoline hydrogenations plants at the Wilmington refinery during World War II.

C. A. YEATMAN

E. Floyd Miller, special consultant for Phillips Petroleum Co.'s exploration department, has resigned and opened offices in the Thompson Building in Tulsa, where he will specialize as a geological consultant and adviser on exploration problems. Prior to joining Phillips he was with Cities Service Oil Co., Marland Oil Co., Reiter-Foster, and A. G. Oliphant.

Felix F. Blanco has been designated by the Argentine Government to study maintenance and operation practices on the major pipe lines in the United States, and arrived on December 7 to take up his new work. Blanco joined Yacimientos Petroliferos Fiscales in 1938 as an instrument expert, and worked at refineries in San Lorenzo, Chachapoyas, and Lujan de Cuyo. Appointed head of the instrument department at the La Plata refinery in 1944, he served as supervisor of the same department in other refineries. In 1947 he joined the Argentine Gas Service Technical Department. He is noted for a development of a weld-inspection method for gas lines, and is in charge of cathodic protection for the 1,100-mile Comodoro Rivadavia - Buenos Aires gas line which was recently laid.

FELIX F. BLANCO

William Hamm, Jr., independent producer, has opened temporary offices in the Bewley Building in Fort Worth, as headquarters for activities in the Southwest. **C. W. Sanders,** Fort Worth geologist, is serving as exploration manager, and **D. H. Ankeny,** St. Paul, Minn., will serve as general manager. Others attached to the office are **William McDufee** and **T. M. McLeod,** both of Fort Worth.

C. H. Wagner has been named vice chairman of the boards of directors of American Oil Co. and its two subsidiaries, Lord Baltimore Filling Stations, Inc., and Mexican Petroleum Corp. **D. J. Smith,** president of Pan American Petroleum & Transport Co., the parent company, said that Wagner has resigned as president of the three firms, and **H. C. Smith,** formerly vice president, was elected president to succeed Wagner in all three capacities. D. J. Smith remains chairman of the board of all three companies.

W. D. Owsley, Halliburton Oil Well Cementing Co., Duncan, Okla., has been elected chairman of the newly organized Southwestern Oklahoma Chapter, American Petroleum Insti-

Newly elected officers of the Delta Section, American Institute of Mining and Metallurgical Engineers. Left to right: Howard Rambin, Jr., assistant division manager, Louisiana-Arkansas Division, The Texas Co., vice chairman; Fred E. Simmons, Jr., petroleum engineer, Louisiana Land & Exploration Co., chairman; E. N. Van Duzee, assistant area manager, Shell Oil Co., vice chairman; E. N. Dunlap, California Research Corp., and H. M. Krause, Jr., assistant division engineer, Humble Oil & Refining Co., directors. Other officers elected include: John Dillon, Shell Oil Co., secretary; J. Randolph Gregson, Rey Supply Co., Inc., treasurer; William Illtrey, Humble Oil & Refining Co., Journal secretary; and Earl Kipp, California Co., director

PERSONALS

tute, Division of Production. Other officers elected include: **J. R. Puckett,** Magnolia Petroleum Co.; **W. C. Merrell,** Duncan Truck & Farm Machinery Co., and **Guy Tucker,** Continental Supply Co., all of Duncan, vice chairmen; and **Charles R. Miller, Jr.,** Schlumberger Well Surveying Corp., Duncan, secretary-treasurer.

Don L. Hyatt, staff geologist for Sohio Petroleum Co. at Oklahoma City, has resigned and joined the Van-Grisso Oil Co., Oklahoma City, as head of that firm's new exploration department. Hyatt is a graduate of Northwestern University, Evanston, Ill., with a B.S. degree in geology. He formerly was with Carter Oil Co. for 14 years before joining Sohio as district geologist for Oklahoma and North and West Texas.

Floyd S. Fisher has been named traffic manager for Magnolia Petroleum Co., Dallas, succeeding **William M. Maddox,** who retired after 38 years of service with the company.

Ralph A. Hockenson, formerly geologist for **Paul H. Pewitt,** Longview, Tex., has joined Carter Oil Co. at Tulsa as secondard-recovery geologist in the exploration department, and will take up his new duties later this month. A graduate of the University of Minnesota, Hockenson formerly worked for the U. S. Bureau of Mines and spent 13 years with Ohio Oil Co. in Tulsa before joining Pewitt.

William A. Slater and **Herbert Henderson,** vice presidents of the Gulf companies, have retired after 42 years of service. Slater since 1939 has been vice president of Gulf Oil Corp. and Gulf Refining Co., in charge of manufacturing and marine departments. He has also served as a director of various Gulf companies. Henderson has served as vice president of Gulf Oil, Gulf Refining, Gulf Research & Development Co., and Venezuela Gulf Refining Co., and chairman of the board of directors of the Neches Butane Products Co. Other retirements announced include: **E. E. Appel,** manager of the building department; **J. G. Glasgow,** manager of engineering and construction, manufacturing department; **H. E. Gibson,** manager of engineering and construction, sales department; and **W. V. C. Bulkeley,** general manager of the sales department. Their successors have not been announced.

Charles B. Rayner, formerly petroleum consultant to the State Department and more recently Washington representative of American Independent Oil Co., took over this week as chief of the petroleum section of the National Security Resources Board, succeeding **Col. Gus Vogel** who was assigned to the post in November 1948. Rayner will be the first civilian to head the petroleum branch, now a part of a general energy division headed by **Ed Falck,** who has been serving as natural-gas consultant to the board.

E. W. Jacobson, Gulf Research & Development Co., Pittsburgh, has been elected chairman of the Petroleum Division, American Society of Mechanical Engineers, and **J. M. Sexton,** M. W. Kellogg Co., New York, has been named secretary.

Thomas J. Hanlon, veteran of 30 years in the legal department of Sinclair Oil & Gas Co., has retired from the company. He formerly was stationed in Tulsa but in 1932 was transferred to the firm's Independence, Kans., office.

North Bigbee, formerly in charge of public relations for the Texas Mid-Continent Oil and Gas Association, and now a free-lance writer with headquarters in Dallas, is the author of an article entitled "Why We Aren't Running Short of Oil," appearing in the January issue of The Reader's Digest.

John M. Vetter has been elected vice president of Pan American Production Co., and in addition will continue as assistant manager of the company. He will relinquish his duties as assistant manager of Pan American Gas Co., however. Vetter joined Pan American Production in 1935 as chief geologist; was made superintendent of land and geology in 1938, and was appointed assistant manager of both the production and gas companies in 1947. Before joining Pan American he was with Rio Bravo Oil Co. as superintendent of the land and geological departments. **A. C. Golden, Jr.,** has been named manager of Pan American Gas Co., and will continue serving as assistant to the vice president of Pan American Production Co. He joined the company in 1938.

JOHN M. VETTER

DEATHS

J. R. Simpson, 66, Tulsa, former president of Home-Stake Oil & Gas Co. and Home-Stake Royalty Corp. before his retirement in 1947, died January 1. He was elected chairman of the boards of directors of the two firms upon his retirement and held that position at the time of his death.

H. E. Hays, 53, formerly with the old P. & R. Refining Co. refinery at Tulsa and later with Phillips Petroleum Co., died in Kansas City, Kans., December 30.

John Patrick Shannon, 77, Fort Worth, formerly vice president and general manager of Snowden-McSweeney Co. at the time its oil properties were sold to Texas Gulf Producing Co., died December 28 in Battle Creek, Mich.

J. R. Higgins, 73, president of J. R. Higgins Drilling Co. and a partner in the Higgins-Krueger Drilling Co., died in Tulsa December 30. He was a native of Clarion County, Pennsylvania.

Robert J. Wimmer, Sr., 70, for 28 years a foreman at the Bayway refinery of Esso Standard Oil Co. in Linden, N. J., died December 27 in Elizabeth, N. J.

A. W. Lindley, retired general superintendent for Eason Oil Co., Enid, Okla., died in San Diego, Calif., December 28.

William A. Slagle, 53, employed at Humble Oil & Refining Co.'s Baytown, Tex., refinery for 27 years, died December 27.

William J. Anderson, 49, Port Arthur, Tex., tanker quartermaster for The Texas Co., died in Port Arthur December 24.

Bibb D. Haltom, 52, manager of W. S. Farish & Co., Houston, died December 26.

Arnold B. Smith, 42, president of Sylvestre Oil Co., New York marketing affiliate of Esso Standard Oil Co., died December 24 in White Plains, N. Y.

Herbert R. Gallagher, 66, former senior vice president of Shell Oil Co., died in Woodside, Calif., December 31.

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*Hycar valve seat molded by Acushnet Process Company, New Bedford, Mass.

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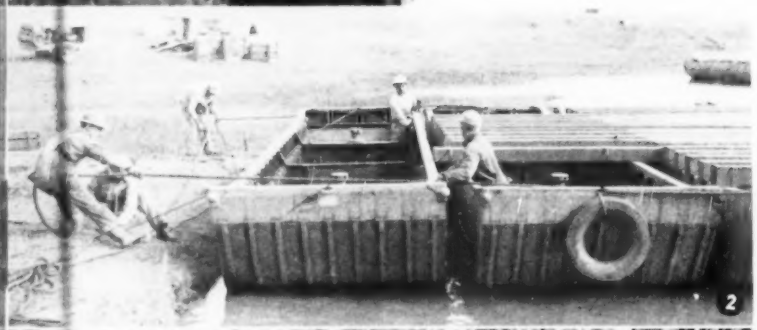
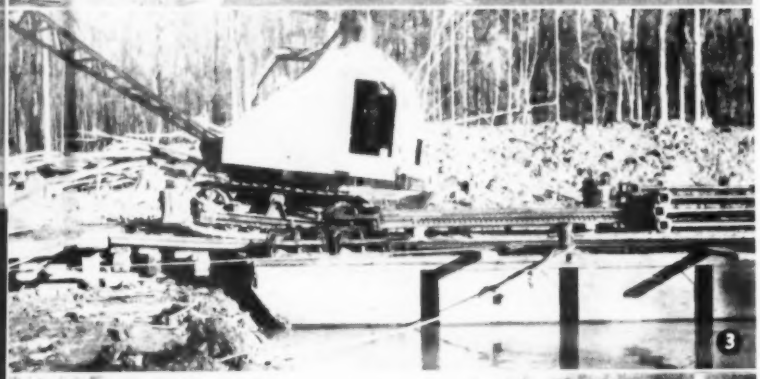
Army Teaches Oil Industry

New Tricks in Getting From Here to There

by Leigh S. McCaslin, Jr.
District Editor

The wide variety of uses which can be made of Portable Bridge and Equipment Co.'s barge, bridging, and roadway material is indicated by these pictures. Much of this material was developed and battle proved during World War II, but company engineers have redesigned and adapted it for industry. Portable Bridge's huge stockpile of bridges, roadway, and barges has a replacement value of $5,000,000.





TEMPORARY bridges, roadway, and barges that will handle the maximum loads usually encountered, are a new development for oil-field service. Available equipment includes more than 2 miles of portable bridges, 7 miles of steel roadway, and assorted portable pontoon bridges. Portable Bridge & Equipment Co., the organization supplying this new service, has thoroughly tested the new equipment and now is offering it for use on a rental basis.

Many of the materials and methods were developed and battle-proven during World War II. Company engineers have redesigned and adapted it to provide temporary bridging and emergency obstacle crossing for industry. Emphasis is on portability, economy, and speed of erection.

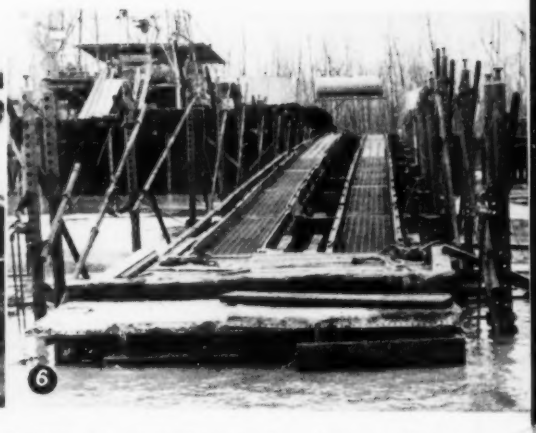
A huge stockpile of bridges, roadway, and barges has been provided which would cost in excess of $5,000,000 to replace. The equipment has

1—An existing bridge has been reinforced to support the heavy loads involved in moving a drilling rig. The truck and draw works, in the picture, weigh approximately 40 tons

2—Workmen assemble a steel pontoon barge which will be used to transport oil field equipment in the South Louisiana swamps. The individual pontoons are held together by the wooden sills which are clamped on. Flooring is laid on top of the wooden sills. When dismantled, the barge can be moved into locations which are inaccessible to standard floating equipment

3—A second type barge, constructed of steel cubes, is being used to move a dragline into a marsh location. Portable bridging material, which can be seen on the barge, is also being carried

4—This rubber pontoon barge with steel treadway mounted on it is returning from a drilling location with an empty truck. For this particular operation, Gulf Refining Co. dug a 1-mile-long canal to provide access to the wildcat

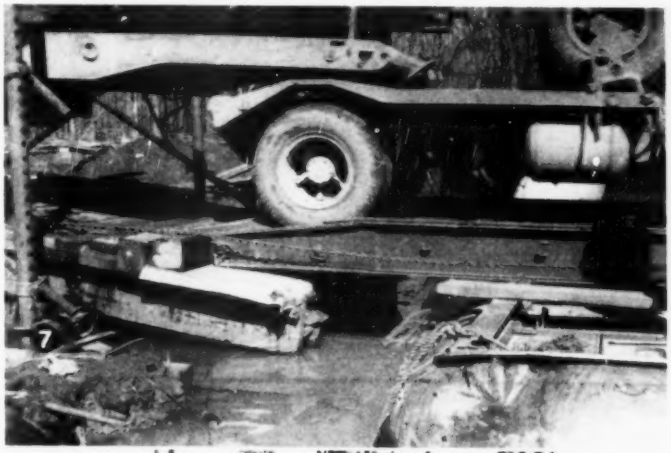


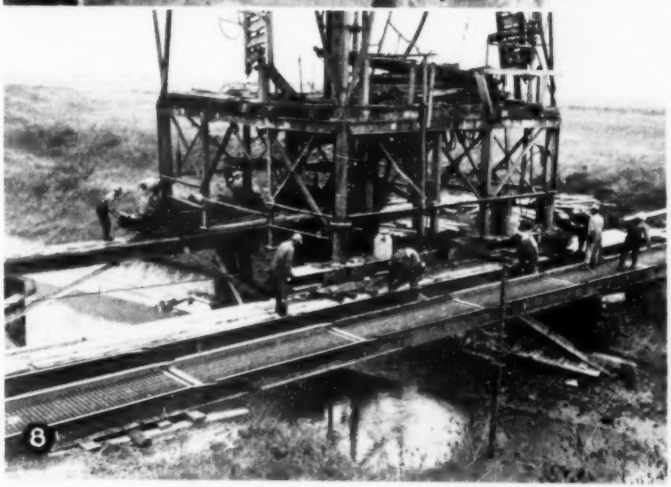
already been used for many jobs along the Gulf Coast from Corpus Christi to Mississippi. Service points and stockpiles of material have been set up at a number of points in the area. Users of the equipment include drilling contractors, pipe-line contractors, riggers, trucking contractors, and oil operators.

The basic items of equipment which Portable Bridge has available in its interesting new business are as follows:

1. **Steel treadway.**—A steel treadway consists of two parallel steel channel beams tied together laterally by I-beams, channels, and pipe sleeves. It has a road surface of I-beam lock flooring. Steel treadways, which normally form the roadway of a bridge, can be used in a number of different ways as required. (This is the type of bridge flooring on which the American armies crossed the Rhine River into Germany during World War II.) They can be laid out on the ground or on matting boards side by side to cross soft spots or small ditches. They can be installed on the top of existing bridges to take the bulk of the load, thus strengthening the structure. They can be used to build short-span fixed bridges without intermediate

(Continued on page 72)





5—At this Trinity River location in Texas, steel-treadway bridge material is being used for a barge loading ramp. The ramp was built three treadways wide so that trucks can be loaded two abreast without moving the barge. Water level varies 5 ft. in this location, but this can be handled easily by raising and lowering the treadway bridge

6—Ramp built at the well site for unloading operations. This treadway ramp was dismantled in 4 ft. of water, after the well proved to be a dry hole

7—This closeup shows clearly the rigid connection possible between the access ramp and floating barge. The steel treadway sections overlap the ends of the barge and rest on the solid ramp to provide favorable unloading and loading conditions

8—In South Gillock field of Galveston County, Texas, a steel-treadway bridge enabled a drilling contractor to skid his rig rather than tearing down and rigging up again. A bridge for trucks had been built earlier, so a single treadway section was built 24 ft. from it to fit the rig substructure

Details of

Conversion of Atmospheric Cooling Tower to Induced-Draft Operation

by Raymond Todd*

DURING the past summer Pacific Lighting Corp. has completed the reconstruction of a 29-bay atmospheric-type cooling tower so as to convert it to induced-draft operation. This tower is part of the facilities installed at Goleta gas storage field, located approximately 8 miles north of Santa Barbara, Calif.

Several reasons prompted consideration of revisions in the atmospheric cooling facilities which existed at the Goleta plant.

First, the unsightly appearance of the existing tower detracted from the over-all appearance of the plant facilities.

Second, the high cost of maintenance of the surrounding plant facilities due to the water spray from the cooling tower. The tower was located on the windward side of the main compressor building, and, therefore, the trench piping and other equipment around the plant were continually exposed to the cooling-tower spray.

Third, the large amount of water wasted from the atmospheric tower in the form of spray and wind loss. A check of plant operating data indicated that cooling-tower spray and wind loss at times amounted to as much as 25 per cent of the total plant water consumption. Wind loss from the tower with only a moderate wind has amounted to as much as 30,000 gal. of water per day. In view of the difficulty in developing water in this area, such a large loss of water was of major importance and, therefore, was one of the primary reasons which promoted the revision of the cooling facilities.

Fourth, the cooling capacity of the atmospheric tower was inadequate under certain atmospheric conditions.

Inasmuch as these cooling-tower problems are common to the operation of most atmospheric towers, it was felt that a brief presentation of the changes which were made in our facilities to overcome these difficulties might be of benefit to others.

The cooling facilities at Goleta are a part of the compressor and dehydration plants which were installed in conjunction with the injection and withdrawal of natural gas in underground storage. The tower provides cooling for several different operations consisting of:

1. Cooling of gas which is withdrawn during the winter time.
2. Cooling of compressor engine jacket water while gas is being injected for storage during the summer.
3. Cooling of diethylene glycol in conjunction with the dehydration of gas during periods of withdrawal.

The original cooling tower installed at Goleta was constructed in 1939 and consisted of six bays. As the Goleta storage project developed and facilities were extended, this original tower was added to until in 1948 it consisted of 29 bays, was 179 ft. in length, and 43 ft. in height including the coil shed. The cooling tower itself was 12 ft. in width and was installed over a coil shed which housed the cooling coils for the various services.

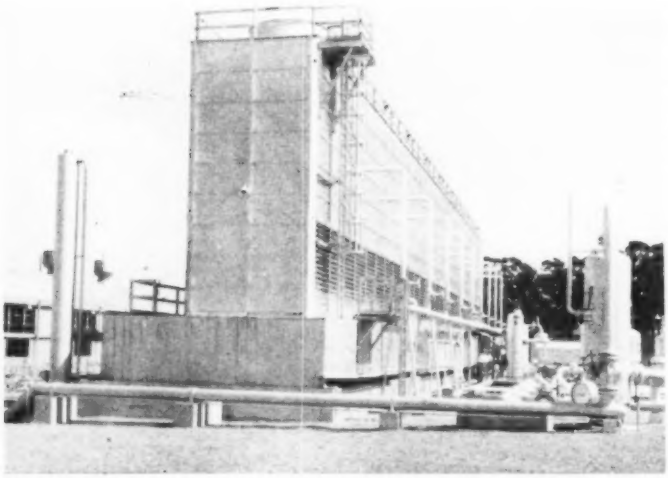
Several Types Considered

In endeavoring to arrive at the most economical means of solving the problems presented by the atmospheric cooling tower at Goleta, consideration was given to the several types of installations.

One possible solution of the problem was to install radiator-type cooling. This type of cooling is very desirable inasmuch as it entirely eliminates the use of water as the facilities consist of fans blowing air across the extended fin coils. A disadvantage of this type of cooling is that it generally is not practical for cooling services where temperatures lower than 15 above the ambient air temperature are necessary. The jacket water cooling at Goleta met these requirements. However, cooling of gas and glycol during withdrawal periods did not come within this temperature range, and, therefore, some other type of supplementary cooling would have to be provided.

Inasmuch as the atmospheric tower was unsatisfactory, it did not seem advisable to maintain a portion of it for the lower cooling requirements. The only alternative would be to install an induced-draft tower in the location of a portion of the present

*Chief engineer, Pacific Lighting Corp. Paper presented at recent C.N.G.A. meeting



A view of the tower after changeover to forced-draft operation

This photograph of the converted cooling tower shows the fan installation for the second half of the unit

atmospheric tower and utilize a portion of the present cooling-tower basin. This would eliminate the necessity of relocating and repiping the gas and glycol cooling coils. Such an installation, it was estimated, would cost $60,000. The radiator-type cooling equipment for jacket water would cost, completely installed, along with necessary piping, $45,000, which would make a total cost of $105,000 for these cooling facilities.

A second possible solution would be to install a new induced-draft cooling tower for all cooling requirements. Operating conditions at Goleta made it impossible to install a new induced-draft tower in the location of the present atmospheric tower. An induced-draft tower to handle all cooling requirements would consist of three (24 by 24 ft.) cells and would cost, completely installed, with concrete basin, approximately $60,000. The installation of the jacket-water and gas-cooling coils in a new induced-draft tower along with necessary piping would cost $36,000, or a total cost of approximately $96,000.

The third solution would be to alter the present cooling tower to convert it to induced-draft operation. Inasmuch as the structural portion of the existing atmospheric tower and the concrete basin were in good condition, it was felt that consideration should be given to converting the present tower to induced-draft operation.

The above figures show that the installation and repiping of the cooling coils in the new induced-draft tower amounted to over one-third the total cost, and, therefore, if this work could be eliminated, a major saving could be effected. In view of this saving, preliminary estimates were made covering the costs of converting the atmospheric tower to induced-draft operation. These estimates indicated that the tower could be reconstructed for approximately $55,000. In view of the large difference in cost between this method of solving the cooling problem and the other possible installations, it was decided to proceed with the detail design of the reconstruction of the atmospheric tower.

Requirements Established

In order to be assured that the conversion of the tower would solve the various problems with which we were confronted, the following requirements were set up:

1. The wall of the tower was to be of double construction with the inside surface of 1-in. T.&G. Redwood and the outside surface of $\frac{3}{8}$-in. waterproof plywood. These two surfaces to be separated by air space $1\frac{3}{4}$ in. wide. The air space was to be continuous and open at both top and bottom so as to prevent any carry-over of moisture from the inside wall to the outside wall. Recent experience in maintaining the exterior surface of induced-draft cooling towers had shown that a plywood surface stood up better and presented a better appearance than a surface of 1-in. T.&G.

2. All joints on the wall panels for the cooling-tower structure which extended to the outside were to be sealed by mastic in order to eliminate any possible leakage of water.

3. In order to assure that the construction of the tower would be waterproof in all respects, it was specified that the exterior of the tower should be free from any leakage for a period of 1 year and in the event leaks did occur, the contractor would make the necessary alterations to repair such leaks at his own expense.

4. The performance of the cooling tower was to be guaranteed to cool 3,000 g.p.m. from 88° to 73° F. with 66° F. wet-bulb temperature. These were the same cooling specifications for which the atmospheric tower was designed with the exception that they were based on a 3-m.p.h. wind through the tower. There was to be incorporated in the guarantee a set of performance curves which would set forth the guaranteed performance for all wet-bulb temperatures within a specified range.

In order that the tower structure carry the added loads imposed on it by fans, their operating equipment, and the additional wind load resulting from the side of the tower being covered solid, it was necessary to reduce the over-all height of the original tower by 8 ft. and improve the joint efficiency in the diagonal bracing. This was accomplished by installing brass gusset plates between the diagonal bracing and the vertical members in the cooling tower.

In view of the 12-ft. width of the original cooling tower, the maximum size fan which could be installed was 8 ft. in diameter. In order to meet the cooling conditions, it was necessary to install nine fans on top of the tower, each one drawing air through a separate cell. The two end cells on the tower were 12 by 24 ft. while the remaining seven cells were 12 by 18 ft. The end cells, being larger, required more air be drawn through them, and, therefore, the fans on these cells were driven by a 15-hp. motor whereas the remaining seven fans were driven by $7\frac{1}{2}$-hp. motors.

The cooling-tower fan motors were to be controlled from a central panel board located in the auxiliary room adjoining the main compressor-engine building. This panel board, in addition to starting and stopping switches for each individual motor, was to be equipped with lights which indicated which fans on the tower were in operation. It was also necessary to provide for disconnect switches at the individual motors to prevent their being started by the remote-control switch during the time the fan mechanism was being worked on.

Inasmuch as the fill in the old atmospheric cooling tower was designed for a horizontal passage of air through the tower instead of the vertical movement of air which occurs in an induced-draft tower, it was necessary to remove all of the fill from the tower and replace it with a new fill which was designed for induced-draft operation. It is generally agreed that it would have been impossible to utilize the old fill material in converting the tower to induced-draft operation.

(Continued on page 73)

Doping Equipment

. . used on western section of Texas Gas Transmission Corp. pipe line

IN laying pipe for 63 miles at the extreme western end of Texas Gas Transmission Corp.'s 803-mile, 26-in. Carthage, Tex.-Middletown, Ohio, system, the contractor, Fowler Brothers, is making one of the early big-inch applications of the spray-ring-type dope machine which incorporates features which are distinct departures from current practice.

The starting of the Fowler Brothers section was delayed until this fall to conform with the pipe-delivery schedules of Texas Gas Transmission's 1949 program for laying 740 miles of the project contracted by Latex Construction Co.; O. C. Whitaker Co.; J. R. Horrigan Construction Co.; Williams Brothers Corp.; Midwestern Constructors, Inc.; Omaha Dredge & Dock Co., and N. A. Saigh Co. Fowler Brothers subcontracts from Saigh the 63 miles extending northeastward from Carthage field. The remaining 40 miles of the Saigh 103-mile section is being built by Oklahoma Contracting Co.

The Carthage-Middletown line was actually started by laying 63 miles in the Lula, Miss.-Memphis section in 1948.

While utilization of the Crose spray-ring-type coating-and-wrapping machine appears as an innovation it is really an application of a design principle developed several years ago which is now being extensively applied for the first time in field operations. The main features of this equipment may be summarized as follows:

1. The heated spray ring placed 1½ in. from the pipe has been designed so that dope will not freeze in it; the large space between the ring and the pipe facilitates application of coating particularly on pipe which has been egged, dented, or wrinkled.

2. Coating is sprayed against a circular baffle to insure uniformity of coating thickness.

3. The self-contained heating system maintains temperature of the coating material in the sump in the lower part of the machine as well as in the spray ring.

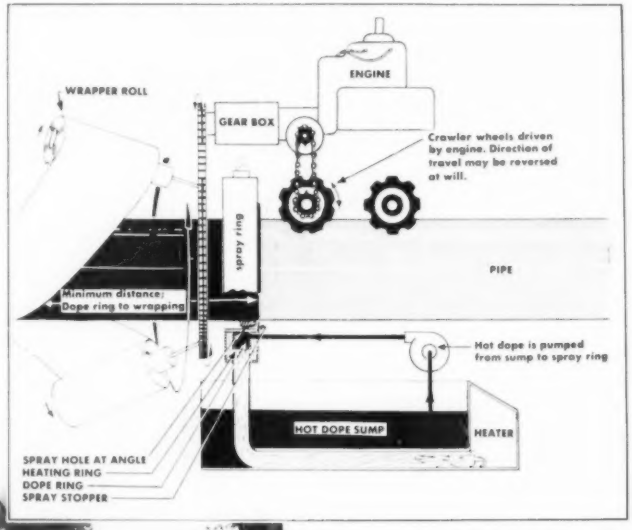
4. Variable-speed operation assists adjustment of the lap of the wrapping.

This machine has been built to be especially suited for wrapping pipe with glass. It can be readily backed up and started again without interference with the coating job. An additional spray along the bottom of the pipe may be installed ahead or behind the spray ring to facilitate application of greater thickness of coating on the bottom of the pipe.

Uniformity of coating thickness thus attained is becoming more important in the protection of large-diameter pipe. With the present thin-wall large-diameter pipe commonly used, pipe egging is a common condition which often interferes with uniform coating application.

This spray-ring-type coating machine functions with several characteristic operations:

1. A gear-type blower furnishes air



Left: Spray-ring type dope machine and kettle operated with hydraulic agitation on Texas Gas Transmission Corp. 26-in. line

Above: Diagram to show how a spray-ring type dope machine functions

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for a low-pressure burner installed at the front of the coating pan. Heat from the burner is circulated through the bottom of the pan so as to maintain a constant coating temperature in the pan. Heated air then moves from the bottom up through the spray ring and is exhausted through the stack at the top of the spray ring.

2. Two pumps are mounted on the machine: one pump moves coating from the kettle to the pan in the machine; the pump may be reversed to move the coating back to the kettle if necessary; the other pump moves coating from the sump to the spray ring.

3. A pressure-relief valve has been installed on the bottom of the spray ring so that spray pressure can be controlled with this valve. The unit is powered by a 12-hp. air-cooled engine which can be operated with three speeds forward and one in reverse.

4. The rubber crawlers on which the machine is mounted move along a double coat on the bottom of the pipe.

Variable operating gears make it possible to adjust the lap of wrapping within a few seconds. With this type of machine no sprocket change is needed for lap adjustment.

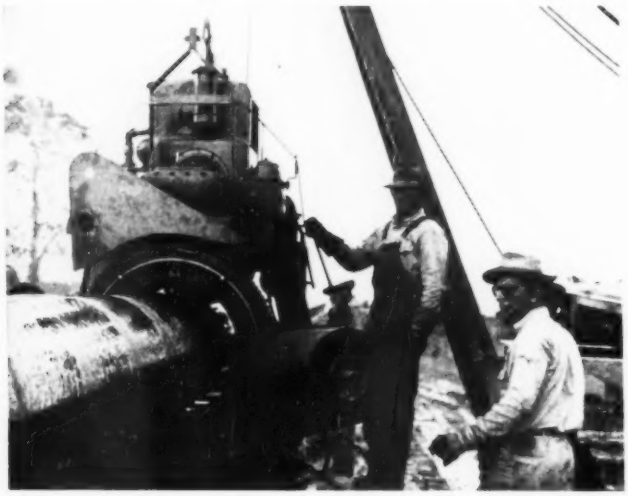
Hydraulic Agitation

The dope machine is served by three 23-bbl. pots. A unique feature of the pots is the provision for hydraulic agitation. The sweep or agitator is actuated by a hydraulic piston. In the event that a large chunk of coating happens to jam the agitator a 1,000-lb. relief valve bypasses the hydraulic fluid until such time as the coating chunk is melted to such an extent that the pressure against the relief valve is released to 1,000 lb. Then the agitator resumes its operation. The pots have been made so that they are fairly low making it easier to load them.

The pipe is protected against damage by rubber crawler wheels on both the cleaning and dope machines.

The fact that the heating system of spray-ring-type dope unit has been designed so that the machine will not freeze due to congealing of the coating when operation is stopped is advantageous particularly in rough country where it is often necessary to start and stop frequently, both for wrapper changes and for providing proper cradling of the pipe. With this unit it is not necessary to circulate the coating or to thaw out the machine before starting it up. This is because the heating system maintains the coating in the pan and in the ring at proper application temperature.

The functions performed by dope machines are becoming of increasing importance in pipe-line construction. Most pipe lines are spending more for coating and wrapping than formerly. Application of these materials assume a substantial part of over-all contractor's costs. The investment in cleaning and priming machines, coating and wrapping machines, cradles, tractors, trucks, etc., serving dope operations amounts to between $125,000 and $150,000 for a big-inch spread, representing approximately 20 to 25 per cent of the entire spread investment.

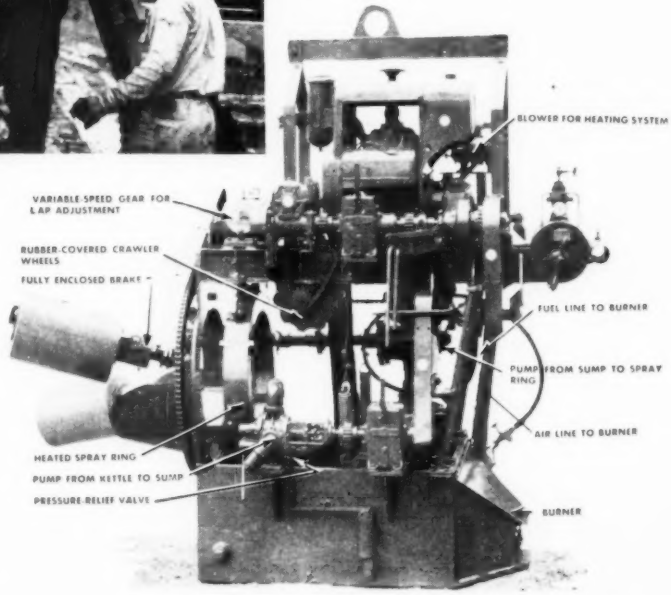


Left: Dope machine operated by Fowler Brothers near Carthage, Tex., on Texas Gas Transmission line, photographed to show open space between spray-ring and 26-in. pipe

without marking or nicking the pipe.

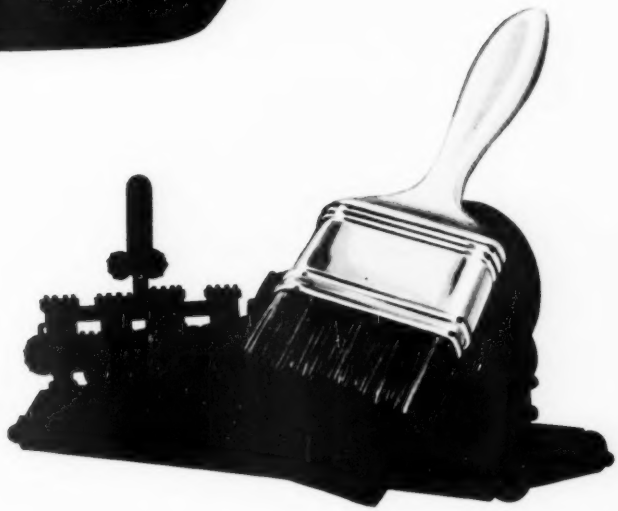
5. The brake is fully enclosed thus removing the possibility of danger from dope material getting into the brake mechanism. One of these fully enclosed brakes has been installed on each of the wrapper arms for holding proper tension on the roll of wrapping material so that fouling up may be avoided.

Application of the dope material is accomplished by spraying from the main spray ring which is 1½ in. from the pipe. Sprayed dope hits a small circular baffle plate so as to flatten the spray, thus fanning it out on the pipe instead of having it hit in a solid stream. The main spray ring is supplemented with an auxiliary wye-shaped coating spray below the pipe. This auxiliary spray is about 12 in. in width, making it possible to apply



Below: Photograph of spray-ring type dope machine with parts identified

on the brush it's blue paint on the pump *it's a pledge!*



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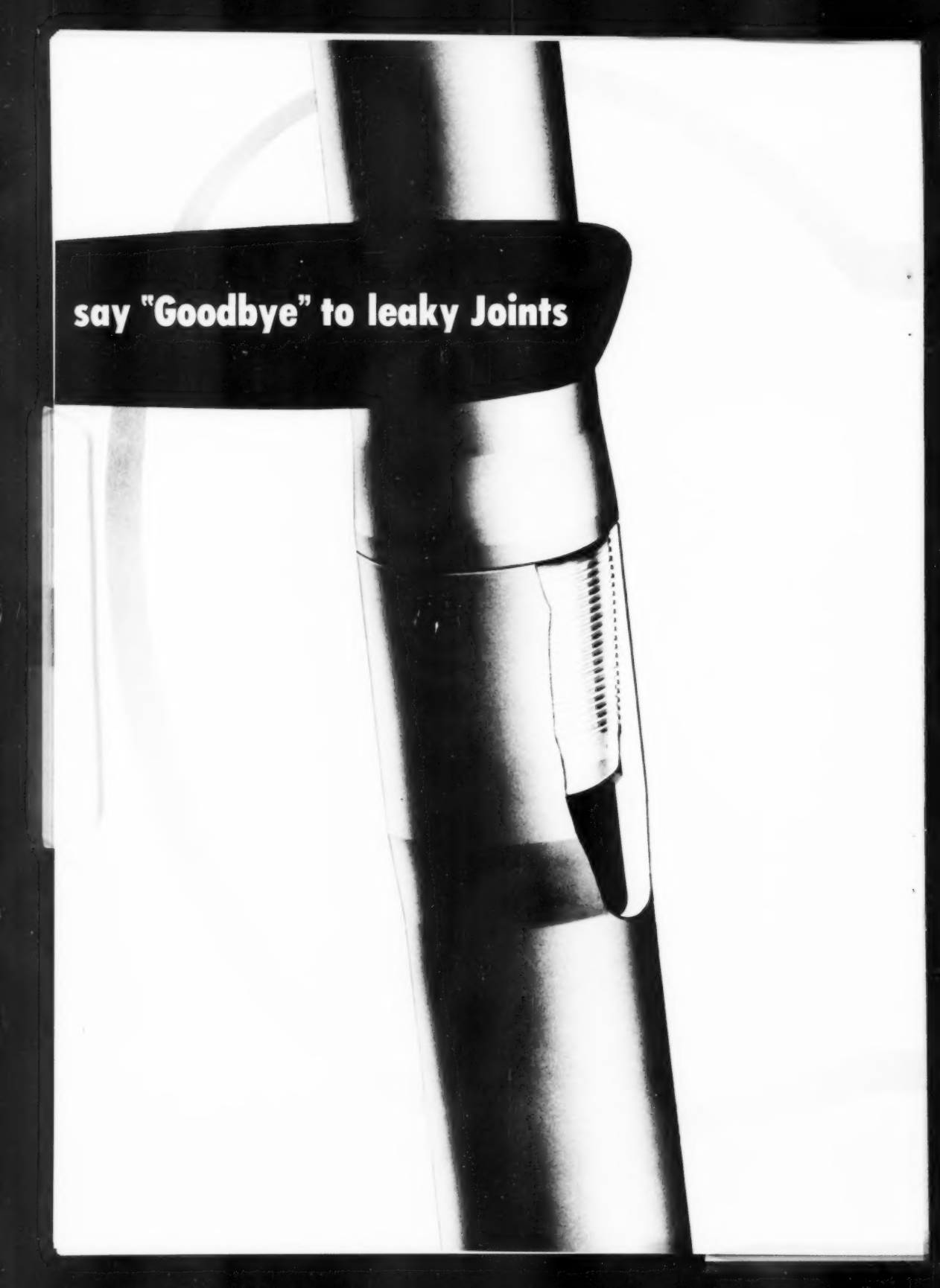
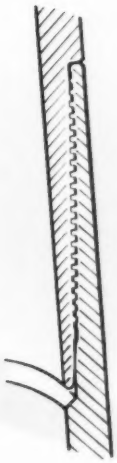

say "Goodbye" to leaky Joints



This is the seal that protects deep well strings

You can say, "goodbye," to leaky joints at any depth when you run your strings with Spang Extreme Line Casing. That's because Spang Extreme Line Casing has an exclusive metal-to-metal seal. The threads are relieved of the sealing function . . . they serve only as a mechanical interlock.

The Spang Extreme Line Casing Seal provides positive resistance to leakage in the deepest wells. It consists of a curved surface that extends beyond the male threads and fits snugly into a tapered conical seat beyond the mating female threads.

What's more, the joints of Spang Extreme Line Casing will not leak even when subjected to external or internal pressures sufficient to collapse or burst the body of the casing. This is true even though the string is subjected to heavy loads in tension, compression and bending at the same time.

Why not get all the facts on this popular Spang product? Just contact your National Supply Store, or write for a copy of our 20-page booklet, *Spang Extreme Line Casing.*

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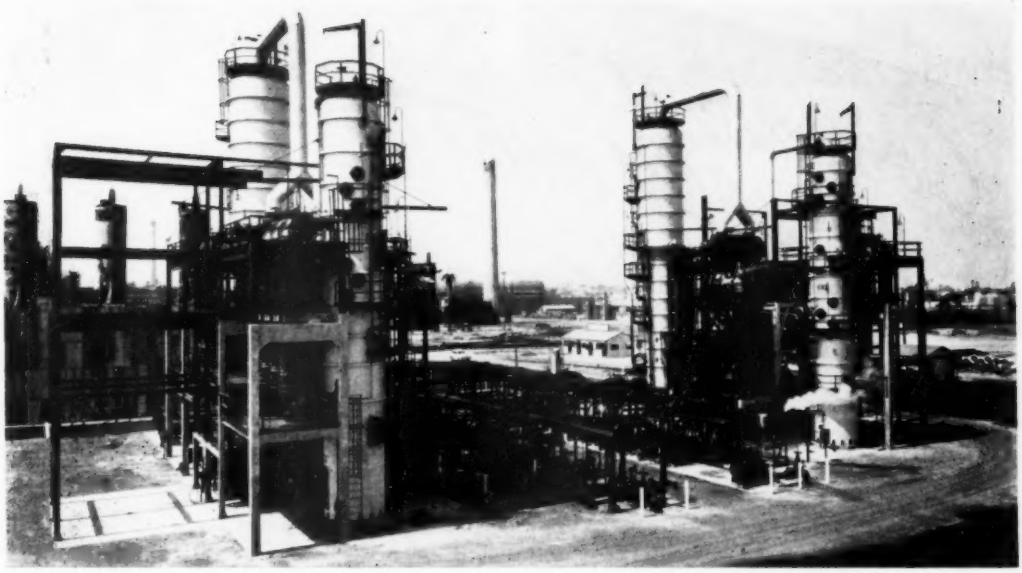

The twin naphtha-rerun units at Standard Oil Co. of California's El Segundo refinery. The units are identical: a single control room is located midway between the units at the far end of the pump line

Twin Naphtha-Rerun Units

. . . installed at El Segundo refinery of Standard Oil Co. of California

by Robert Harwick
District Editor

STANDARD OIL CO. OF CALIFORNIA has placed two new units in operation at its El Segundo refinery. The units are twin naphtha rerun plants with rated capacity of 11,000 bbl. per day for each plant. Feed is cracked, treated naphtha from the thermal cracking and thermal reforming units. Products are one, two, or three gasoline streams and a stream of gas oil.

The new units replace an installation of five steam stills. With the new rerun plants in operation, the old equipment will be dismantled. Process flow for the new naphtha units is quite simple. Essentially the operation is two-stage vacuum distillation.

The feed is initially heated through exchange with product streams. It is then brought up to temperature by steam preheaters. At this point it enters the low-vacuum column which operates 12-14 in. of mercury. Gasoline is obtained overhead and bottoms are charged to the high-vacuum column after being brought up to temperature in steam preheaters. The distillation is completed in this column which operates at 26-28 in. of mercury.

Approximately 50 per cent of the charge goes overhead from the low-vacuum still and 80 to 90 per cent of charge to the high-vacuum still is taken overhead or in combination with a side cut. Gas-oil bottoms make up the remaining 10 to 20 per cent of the high-vacuum-column yield.

In planning and designing these naphtha-processing plants, two particular problems were faced over and above the actual construction of the units. One problem was the need of flexibility, both as to throughput volume and range of product. The other was the control of corrosive materials remaining in the naphtha, following an acid-treating operation. In some ways the problems overlapped. Through control of corrosion and attendant fouling, flexibility in turn was increased by reducing maintenance problems and improving on-stream time.

Throughput flexibility was achieved largely by building twin units. Each unit as erected is complete within itself. The only equipment that serves both plants are a feed pump and its standby and a water-cooling tower. This arrangement reduces considerably the chance of a complete shutdown of naphtha rerun operations. The use of two units also increases over-all operating efficiency since each may be run closer to capacity.

Three gasoline streams can be produced by each of the units, giving a wide range of product. It is possible to combine these streams, run them separately, or operate without the side cut from the high-vacuum column. These various operating schemes provide flexibility in meeting market demand or blending requirements. The gas-oil stream from the bottom of the high-vacuum column is used for blending with fuel oils.

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Acidic components in the treated naphtha are principally alkyl sulfates which upon decomposition largely produce sulfurous and sulfuric acids. Corrosion control is obtained mainly by operating the units below 300° F., the temperature above which decomposition of the acidic compounds becomes rapid. This low-temperature operation is made possible with two stages of distillation at reduced pressures.

Operation at reduced temperatures will mitigate but will not eliminate decomposition of the acidic compounds. Since some acid is found, a neutralizing system is built into the unit to reduce corrosion. This system operates by injecting caustic solution into the naphtha stream. Injection points are provided in the naphtha charge line and in the main units and in reflux lines. There are 13 injection points in all, although not all are in use at this time. Addition of the sodium hydroxide solution is made through a proportioning pump. The amount of caustic is regulated manually.

Adding caustic to combat one form of corrosion also introduces the possibility of corrosion through caustic embrittlement. This problem is met by improving resistance of the column shells, stress relieving them at the time of their fabrication.

One other source of corrosion, outside the naphtha cycle, is from carbon dioxide in the steam for preheaters and stripping steam for the columns. Here ammonia is added to neutralize the CO_2; a proportioning pump is used for this purpose.

Recorders for pH values, located in the boots of the reflux accumulators, measure the acidity of steam condensate. By varying the amount of ammonia to the stripping steam, acid content of the condensate is held to desired limits.

The units have not as yet been in operation long enough to determine definitely the full effectiveness of these corrosion controls. So far as can be measured without a shutdown, corrosion fouling is very low and below what was expected. Values of pH hold within the desired range easily and rate of heat transfer remains at, or better than, design values.

Unit Maintenance

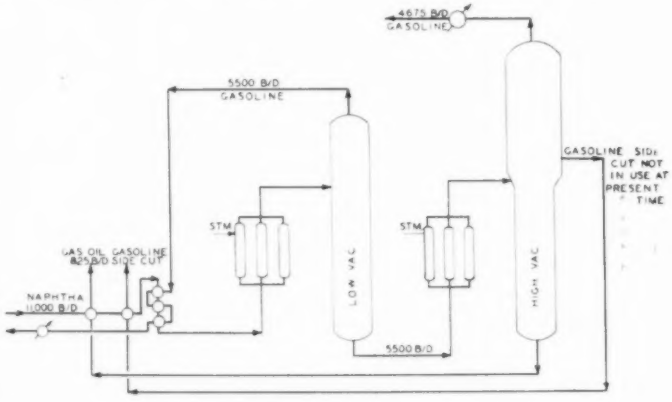
Corrosion considerations were also taken into account in planning for unit maintenance. A good example of this is found in the preheater arrangement on the columns. There are three of these preheaters serving each of the vacuum columns. They are installed vertically and in parallel with the naphtha stream on the tube side and 125 psi. steam in the shell. Steam flow to each set of preheaters is instrument controlled by the temperature of the column feed tray.

As far as process considerations go, two heaters per column are sufficient for distillation. The third is a standby. As sodium sulfate and sulfonate deposits, produced by the neutralizing action of the caustic injection, reduce rate of heat transfer, a heater is cut out and the spare cut in. The fouled exchanger can be cleaned in place. Water is opened into the heater and the tubes flushed. The wash water along with naphtha and dissolved salts goes to a settling tank. The naphtha is skimmed off.

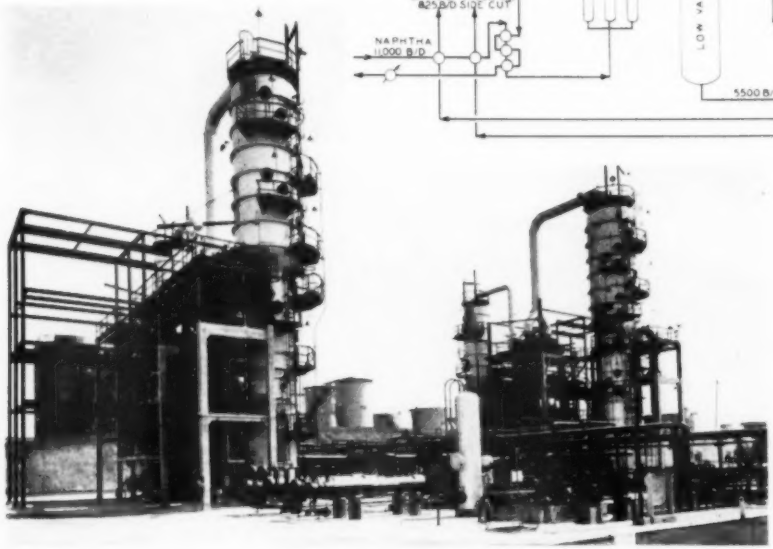
Should major maintenance be required on the preheaters they are easily removable since they rest on beams cantilevered from the main structural framework. After breaking the exchanger piping connections, the apparatus can be removed without disturbing other lines or equipment. This plan of clear approach is carried through the units. Monorails are built in for easy and rapid handling of exchanger heads and tube bundles. The space between the two plants is wide enough for the maneuvering of maintenance equipment and has been kept free of overhead piping.

In order to meet the requirements of plus 150° F. minimum flash on the gas oil leaving the bottom of the

(Continued on page 69)



Above: Schematic flow layout of the naphtha rerun unit



Left: The twin units as seen from the entrance to the plant area. The towers in the foreground are the high-vacuum columns. The group of small pumps in the right foreground are the caustic and ammonia proportioning pumps for corrosion control

Water-Vapor Content of Essentially Nitrogen-Free Natural Gas Saturated at Various Conditions of Temperature and Pressure

by Eugene L. McCarthy,* W. L. Boyd,† and L. S. Reid†

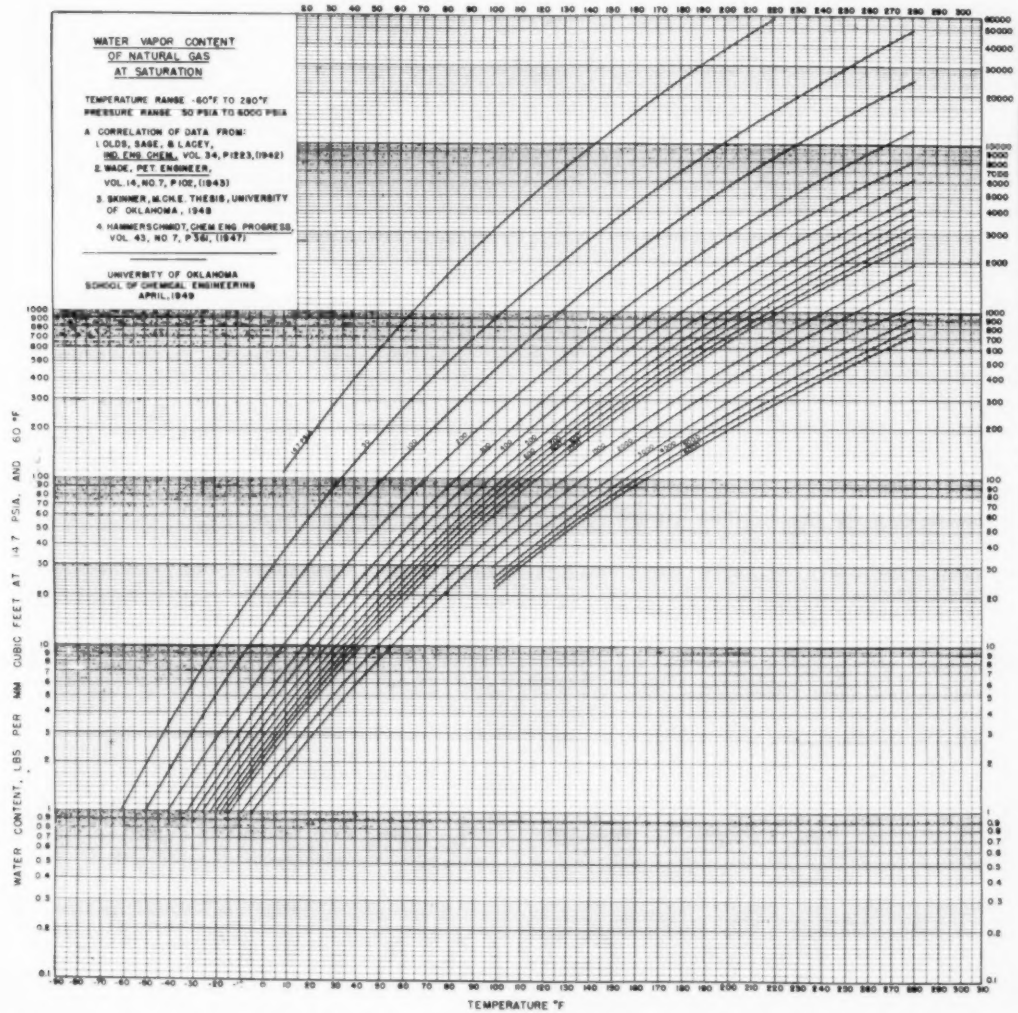
*Black, Sivalls & Bryson, Inc., Kansas City †University of Oklahoma, Norman.

From paper presented at San Antonio meeting, A.I.M.E.

PROPER control of the moisture content of natural gas is essential to reliable operation of gas-transmission and distribution facilities serving northern markets. The moisture content of natural gas is usually determined by dew-point measurement at the existing pressure. For any gas of constant moisture content, the dew point varies with the pressure.

A correlation of the data of several investigators is presented here in graphical form. These data were correlated by the authors and F. M. Townsend, C. C. Tsao, M. D. Rogers, Jr., and J. A. Porter; graduate students in chemical engineering at University of Oklahoma.

Of particular interest are the hitherto unpublished low-temperature data observed by Wickliffe Skinner, Jr., which are included in this correlation.


WATER VAPOR CONTENT
OF NATURAL GAS
AT SATURATION
TEMPERATURE RANGE -60°F TO 280°F
PRESSURE RANGE 50 PSIA TO 6000 PSIA
A CORRELATION OF DATA FROM:
1. OLDS, SAGE, & LACEY, IND. ENG. CHEM., VOL 34, P1223, (1942)
2. WADE, PET. ENGINEER, VOL. 14, NO. 7, P 108, (1943)
3. SKINNER, M.CH.E. THESIS, UNIVERSITY OF OKLAHOMA, 1948
4. HAMMERSCHMIDT, CHEM. ENG. PROGRESS, VOL. 43, NO. 7, P 361, (1947)
UNIVERSITY OF OKLAHOMA
SCHOOL OF CHEMICAL ENGINEERING
APRIL, 1949
WATER CONTENT, LBS. PER MM CUBIC FEET AT 14.7 PSIA AND 60 °F
TEMPERATURE °F

This graph, a correlation of data from several sources, provides a quick method for determining the water vapor content of natural gas. Plotted data show the equilibrium water content of natural gas composed chiefly of methane with other paraffin hydrocarbons and essentially free of nitrogen or other inert gases for various temperature-pressure conditions. The low temperature data included here were observed by Wickliffe Skinner, Jr.

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Above: Portion of the reconstructed Port Jerome refinery. This view shows, left, two distillation units and, right, a thermal cracking plant

Right: The Cie. Francaise des Petroles refinery today (Photograph courtesy Standard Francaise des Petroles)

Cie. Francaise des Petroles Enters Second Stage of Postwar Program of Rehabilitating

Port Jerome Refinery

THE first stage of the postwar program for the Port Jerome refinery of Cie. Francaise des Petroles has been largely completed. This consisted of reconstruction and operation at maximum throughput as quickly as possible in line with the general aims of the French Government and the necessity of meeting immediate product demands.

The second stage, a long-term plan for Port Jerome, embraces new facilities for product quality and improved efficiency of operation. This will extend over several years. Among the principal items included in this project is cracking, either thermal or catalytic, to increase the volume and improve the octane of the refinery's motor fuel production.

Located in Normandy the Port Jerome refinery occupies 470 acres on the bank of the Seine River. It is about 23 miles upriver from Le Havre and about 30 miles from Rouen. The company, which has a major marketing position in France, is controlled by Standard Oil Co. (N. J.) and smaller minority interests are held by Gulf Oil Corp. and Atlantic Refining Co. Crude is received by a pipe line from La Havre.

Prewar, the Port Jerome refinery was among the most modern in Europe. Its crude-oil capacity was about 25,000 bbl. daily, and besides motor and other fuels it produced lubricating oils and asphalt.

Operations came to a halt June 9, 1940, in the face of the German invasion. Acting on orders of French military authorities, refinery personnel destroyed tankage totaling 2,166,870 bbl., and demolished a large proportion of the piping, valves, fittings, electrical installations, and similar facilities.

The Germans systematically looted the refinery during the occupation. They removed the two cracking coils, most of the gas plant and boiler house, lube rerun still, dewaxing plant, white-products treating plant, and other miscellaneous facilities. A kind of finishing touch to the destruction of the refinery was given in 1944 when an Allied bombing destroyed a large part of the sewer system and several buildings.

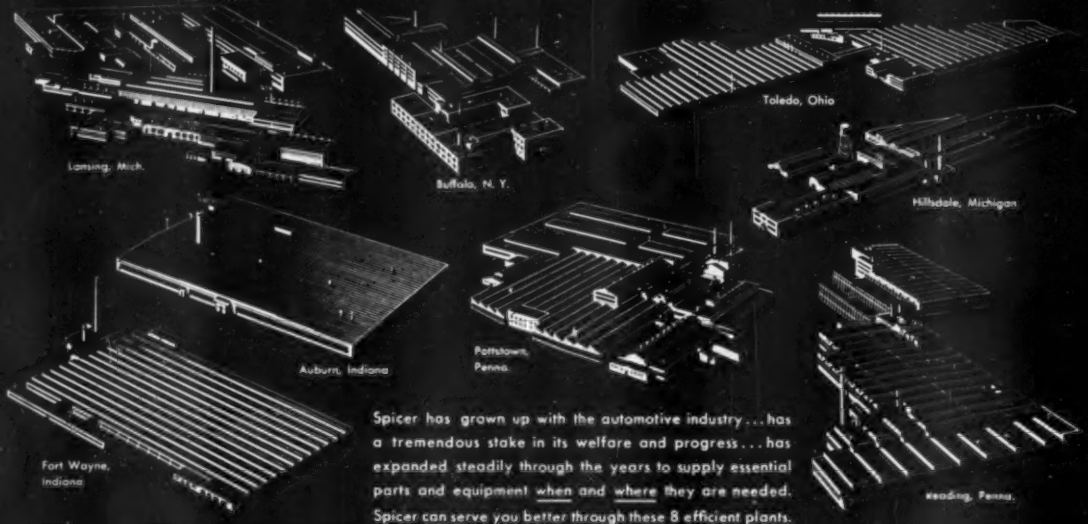
Reconstruction was begun at Port Jerome shortly after liberation of the area in 1944. Part of one cracking coil was found in southeast Germany, and the lube rerun still was recovered in Austria where the Germans had planned to use it to process Austrian oil. The postwar processing scheme has been built around Venezuelan crude oil for lube and asphalt production. Middle East oil also will be processed for gasolines, burning oil and other fuels.

By overhauling the pipe stills, removing bottlenecks, and by making other repairs and improvising material, the refinery was restored to operation in February 1946. Prewar crude throughput capacity was reached in January 1947. By using the two stills and one of the cracking coils, the plant has been given its present capacity of 40,000 bbl. daily. It is now running about 35,000 bbl. daily.

While runs were pushed up as rapidly as possible, reconstruction has

(Continued on page 69)

Spicer has eight great and modern production plants



Spicer has grown up with the automotive industry . . . has a tremendous stake in its welfare and progress . . . has expanded steadily through the years to supply essential parts and equipment when and where they are needed. Spicer can serve you better through these 8 efficient plants.

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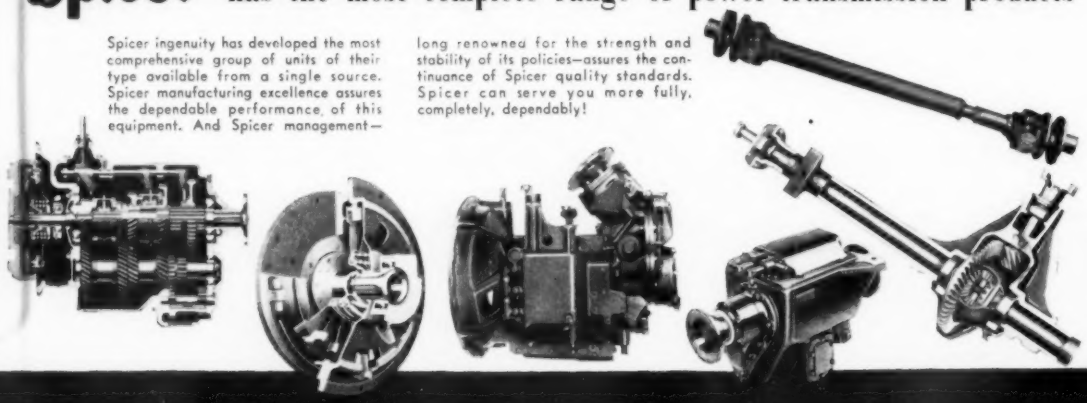

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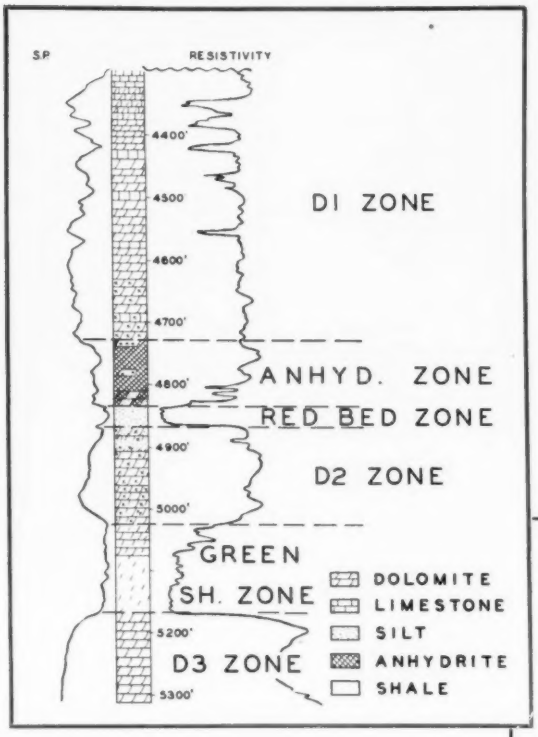


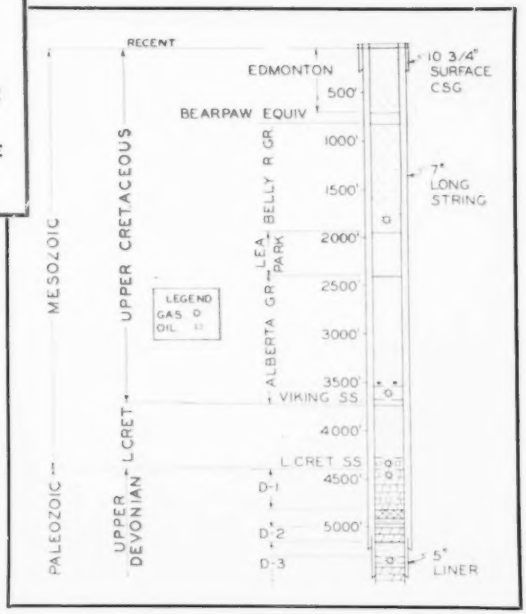
Devonian section in typical Leduc well, showing electric-log anomalies

Recent

CANADIAN OIL

Developments

by J. D. Gustafson*



Leduc geological section, showing casing program for D-3 zone

The western Canada basin where the sediments are thickest comprises only 15 per cent of the nation's land area, but contains roughly 800,000 sq. miles. It extends from the international boundary northwestward 1,800 miles to the Arctic Coast and from the Rocky Mountains on the west to the pre-Cambrian shield on the east. Although Cretaceous, Jurassic, Triassic, and Mississippian possibilities are by no means overlooked in the current exploration in western Canada, Devonian receives most attention.

Development and Production

THERE are now about 45 rigs engaged in development drilling in Alberta and most of these are located in the larger Devonian pools. As of October 1 there were approximately 1,085 producing wells in the province and over 80 per cent of these were in fields which produced high-gravity crude. The current market demand for Alberta's light crude is in the neighborhood of 60,000 bbl. per day.

*Imperial Oil, Ltd., producing department, Calgary, Alta. Material from paper at A.I.M.E. meeting, Petroleum Branch, Los Angeles.

Heavy crude production in Alberta and Saskatchewan during the summer and early fall amounted to some 7,000 bbl. daily. Table 1 presents a summary of the development and production status of light crude pools.

No large increase in actual crude output from western Canada fields is anticipated until completion of the pipe line from Edmonton southeast to Regina and thence to the head of the lakes at Superior, Wis. The line will be about 1,150 miles long and its initial capacity is to be 70,000 bbl. per day. From Superior the crude will be shipped by lake tanker to refineries in southwestern Ontario. Storage capacity in excess of 1 million barrels is to be built at the Superior terminal to permit accumulation of crude during the 5-month season when the lakes are closed. Completion of the project is scheduled for the spring of 1951.

Drilling Conditions

Drilling depths in pool development range from less than 2,000 ft. in the Cretaceous sand pools of western Alberta and eastern Saskatchewan to over 12,000 ft. for Madison limestone production in the foothills.

In Devonian pools the range is from 1,800 ft. at Norman Wells to 6,700 ft. at Normandville. Average depth at Redwater is 3,250 ft. and at Leduc 5,250 ft. The majority of rigs in use are mechanical with diesel power, and drilling is done with rock bits. Most of the drilling rigs are owned and operated by independent contractors. Operations are retarded somewhat in the winter by low temperatures and occasional heavy snowfalls but not to the point of complete standstill. An auxiliary steam boiler to supply heat is a requisite during winter.

Drilling conditions in western Canada are not usually difficult. In the foothills the formations penetrated are extremely hard and steep dips and faults create straight-hole problems but these are overcome by ordinary techniques. In the Central Alberta Plains the chief problem is that the lost circulation and blowout danger which is faced in drilling into fractured vuggy zones of the Devonian. The nature of the problem is illustrated in an accompanying figure which shows the typical geological section at Leduc.

Gas is encountered in sands in the Belly River group, in the Viking zone, and in Lower Cretaceous sands as well as in the D-1 zone of the Devonian and in the top of the D-3. The D-3 zone is extremely vuggy and apparently cavernous in some areas so that even when drilling-mud characteristics are carefully controlled circulation is sometimes lost in drilling in this zone. This permits the gas zones higher up to blow out, the same conditions which precipitated the famous blowout of Atlantic No. 3.

It has not been possible to prevent occasional loss of circulation when drilling into the D-3 and similar horizons but a casing program is now used which practically eliminates the blowout danger. For a D-3 well at Leduc, $10^{3}/_{4}$-in. surface pipe is set below the glacial drift, usually at a depth of 300 ft., and a 9-in. hole is then carried to the base of the green shale just above the pay. At this depth a 7-in. long string is cemented in the hole and the D-3 zone is then drilled through the 7-in. The well is usually completed through perforations in a 5-in. liner which is cemented from bottom hole through the D-3 gas cap and up into the 7-in.

Well Logging and Coring

In addition to drill cutting and core examination, the most widely used form of logging in western Canada is the usual electric log of self-potential and resistivity characteristics. In recent months gamma ray and neutron-log services have become available and are finding use for limestone-formation logging. Probably the most valuable single tool for logging the vuggy fractured zones of the Devonian bioherms is the diamond core barrel. Core recovery in excess of 95 per cent is now usually achieved with the diamond barrel.

Some difficulty is experienced in coring zones which tend to take drilling fluid, but the technique and the tools have been improved to the point where loss of circulation does not prohibit coring. Diamond core-head performance has been improved by increasing the hardness of the matrix and enlarging water courses and in one company's experience average footage cored per bit has been increased from 225 to 450 ft. during the past 2 years. Diamond-coring costs now compare favorably with conventional methods.

Well-Completion Methods

Well-completion methods in Devonian pools vary with the type of reservoir, and to some extent because of the usual differences among operators' preferences. The following generalizations will indicate how practices vary with reservoir conditions. In the relatively tight D-2 zone at Leduc, where lost circulation is not a problem, open-hole completions are made with casing set above the pay, after the hole has been drilled to total depth.

Acidizing is practiced as part of the completion usually only when necessary to cause the well to flow or to improve its flowing characteristics. Because the formation is predominantly dolomite, acidizing is not outstandingly successful in increasing initial potentials. It has yielded better results in wells which have been on production for 6 months or more. In the D-3 zone at Leduc, where most completions are now made through perforated liners, acidizing is usually not considered necessary.

At Redwater where there is no gas cap to be shut off in the D-3 zone most operators favor open-hole completions unless the well is drilled below the water table for reservoir information. In this limestone reservoir acidizing is widely practiced, not so much for the purpose of increasing potential as to decrease the differential between reservoir shut-in pressure and flowing pressure. Because the formation takes acid on a surface vacuum a jet gun is used to provide better coverage of exposed formation in open-hole completions and double-packer acidizing tools are used to acidize through liners.

Producing Conditions

In all of the new large Devonian pools in Alberta first production has been obtained by flowing but in many instances artificial lift will be necessary sooner or later during the producing life of a well. There is a good supply of hydroelectric power in Central Alberta and judging from installations which have been made by a number of operators thus far sucker-rod pumping with electric power will be employed at fields such as Redwater and Leduc.

Producing operations are not seriously hampered by cold weather if proper steps are taken to provide some form of heat at tank batteries. Common practice is to install a low-pressure steam boiler at each tank battery and provide steam to thaw meters and lines and for heating stock tanks when necessary.

One producing problem which faced operators early in the development of the new fields is that of emulsion treating. When Leduc wells began producing water in small amounts it was found that it would be necessary to dehydrate to very close specifications to provide crude acceptable to local refineries. This condition arises because of the very high salt content of water produced from the D-3 zone. The emulsion-treating problem is not difficult in the usual sense and by installing emulsion treaters and with the proper selection of treating chemical and methods, dehydration to very low water percentage is practical even in extremely cold weather.

Paraffin formation in tubing and flow lines is something of a problem especially at Redwater but fortunately pour point of the crude is fairly low. The gas produced from the Madison limestone at Turner Valley and Pincher Creek is quite high in H_2S content, while in the new Devonian pools only Redwater has sour gas.

Reservoir Characteristics

The variation in reservoir conditions encountered in western Canada is comparable in degree to the wide range of depths and formation types.

TABLE 1—ALBERTA LIGHT-CRUDE PRODUCTION (OCTOBER 1, 1949)

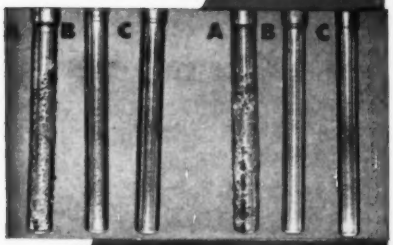
Pool—	Producing horizon	Approximate No. of wells	Approximate producing rate, bbl. per day Sept. 1949
Leduc-Woodbend	D-2 and D-3	315	31,500
Redwater	D-3	195	20,900
Golden Spike	D-3	1	300
Stettler	D-2 and D-3	1	
Turner Valley	Madison	307	10,400
Others		61	1,600
Total		880	*64,700

*September production higher than normal demand because of harvesting season.

STOP RUST

with Monsanto's New

SANTOLENE C



GA... FUEL OIL

Concentrations of Santolene C in tests with light petroleum products are as follows: (A) No Santolene C, test failed; (B) 10 ppm. Santolene C effective, but test failed; (C) 20 ppm. Rust absent. Test passed.

PHYSICAL PROPERTIES OF SANTOLENE C

Color ASTM	5½
Flash Point COC° F.	170
Viscosity at 100° F. SUS	259
Viscosity at 210° F. SUS	52
Pour Point °F	—30
Sp. Gr. 60/60° F.	.884
Pounds per gallon	7.36

The rust problem, in transportation and storage of light petroleum products, is solved by Monsanto's Santolene C. Laboratory tests, results of which are illustrated in the photograph, give evidence of the effectiveness of Santolene C.

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TABLE 2—PRODUCING CONDITIONS AND CRUDE CHARACTERISTICS—FIVE ALBERTA OIL POOLS

Pool—	Pincher Creek	Redwater	Leduc	Leduc	Whitemud	Lloydminster
Formation—	Madison limestone	Devonian D-3	Devonian D-3	Devonian D-2	Lower Cret. ss.	Lower Cret. ss.
Depth, ft.	12,000	3,250	5,350	5,150	4,050	1,900
Original B.H. Pressure, psi.	4,855	1,050	1,894	1,760	1,300	500
Reservoir temperature, °F.	184	94	152	149	124	72
Initial potential range, bbl. per day	*648	600-3,300	100-3,400	100-2,500	200-650	10-500
Solution G.O.R., cu. ft. per bbl. (flash liberation)	21,000	215	733	680	436	Very low
Saturation pressure, psig.		485	1,894	1,760	1,300	(?)
Crude base	Condensate	Paraffin	Paraffin	Paraffin	Intermediate	Asphalt
Crude gravity, °A.P.I.	53	35	41	40	36.5	14
H_2S content, per cent	15	4-5	Nil	Trace	Nil	3
Pour point of crude, °F.	(?)	—15	—5	—10	(?)	10

*Open flow 22,000 to 80,000 M.c.f. per day (two wells).

At one extreme is the shallow Cretaceous sand production where pressures and gas-oil ratios are low and the crude is viscous, while at the other is the deep Madison limestone distillate production in the foothills with high reservoir pressures and temperatures (see Table 2).

While most of the upper Devonian reservoirs are of the same general type, each requires the usual individual analysis and study. The new fields, beginning with Leduc-Woodbend, do not yet have sufficient production history to permit thorough analysis of reservoir behavior but certain tentative conclusions can be drawn. The D-2 zone reservoir at Leduc does not have a large uniform water body underlying the oil and there are only small and localized gas caps. Consequently, the primary recovery mechanism is expected to be solution gas drive.

The D-3 zone has a large gas cap, approximately 1.3 times the oil saturated section in volume, and there is some 600 ft. of water zone underlying and connected with the oil pay. Gas-cap expansion is expected to be the primary recovery mechanism but water-drive action might also have an important role in depleting the reservoir.

At Redwater there is no gas cap and the D-3 zone crude is undersaturated. There is approximately 1,000 ft. of porous water-bearing formation underlying the oil and apparently the oil and water zones are well connected. It is too early to predict whether the size of the aquifer in relation to the volume of the oil pay is such as to permit a fully effective natural water drive, but the low pressure-decline rate to date indicates that water influx is taking place.

One of the principal problems of the geologists and reservoir engineers in dealing with the reef reservoirs is to evaluate the distribution of porosity between the intergranular type and the porosity made up of vugs and fractures. The problem was first attacked through sample examination and by visual measurements of core surfaces but analytical techniques are being developed utilizing the large diamond cores.

An Imperial project using an adaptation of the Purcell method with large cores is now showing considerable promise of yielding an accurate quantitative expression of pore-size distribution at very reasonable cost. A paper on this work may be published in the near future.

Porosity and permeability are being measured on the large-diameter diamond core samples with what are believed to be more accurate results than those obtained from the usual small core plugs. This work is important not only to reserves estimating and reservoir analysis generally but to the planning of producing methods and secondary-recovery programs.

An indication of the magnitude of porosity and permeability found in the Devonian reefs may be had from the following tentative data. The dolomite D-2 zone at Leduc-Woodbend has an average effective porosity of about 10 per cent and permeability of 25 md. The reef dolomite in the D-3 zone has an effective porosity averaging approximately 13 per cent and permeability of 300 md. Effective porosity in the D-3 limestone at Redwater is currently placed at 10 per cent and permeability at 800 md.

General Operating Conditions

Oil-field operations in western Canada are more nearly similar to those in United States fields than to "foreign" operations as typified for example by South America or the Middle East. There are now in the neighborhood of 120 operators actively engaged in exploration and development in western Canada. A majority of the United States firms which are usually classed as the major companies are represented through Canadian subsidiaries while independents are made up of both United States and Canadian operators with the latter being in the majority.

There is no lack of the usual oil-field specialized services including all types of well logging, acidizing, cementing, gun perforating, and laboratory facilities. Equipment supply-store stocks were somewhat limited up to 2 years ago but the supply situation with respect both to competition and stocks now compares with most major oil-producing areas in the United States. So far all of the seamless tubular goods used in Canada comes from the United States mills but much of the line pipe and an increasing proportion of tank and separator steel is of Canadian manufacture. No import duty is collected on most of the material used in drilling and equipping oil and gas wells.

BOOKS

OIL AND GAS FIELD DEVELOPMENT IN UNITED STATES—YEAR BOOK 1949 (REVIEW OF 1948), VOL. XIX. Published by National Oil Scouts and Landmen's Association, Box 1095, Austin, Tex., 902 pp. with tables, maps, geologic columns, diagrams, and also a roster of active and associate members of the association.

The editors have again maintained the standards which have made this book an annual "must" for all oil men who wish to have in handy reference form, a summary of all the high spots of all the scouting and land information accumulated during the preceding year, for all active areas, by the industry's information service.

In condensed form it reports the various factors that made up the greatest exploration and development campaign in the industry's history. In addition it contains, in tabular form, the names, production records, geological data, and available reservoir engineering data on practically all the important oil fields in the United States.

For many areas, particularly some of the more active ones, the data given go beyond exploration and production, to show pipeline outlets, sometimes pipe-line runs by companies, and steel storage. Lists of refineries, natural-gasoline, and cycling plants are included for some of the more important districts, in some cases including production data.

The exploratory data usually give information on the year's active leasing campaigns, often including lists of large acreage blocks held by various companies. Information on geophysical prospecting activity, how much and in what general part of the district is compiled for many areas.

REFRESHER NOTES—HYDRAULICS, THERMODYNAMICS, MACHINE DESIGN, FOR PROFESSIONAL ENGINEERS' LICENSE EXAMINATION. By John D. Constance, 625 Hudson Terrace, Cliffside Park, N. J. $4.50

This work was primarily designed to prove helpful in its coverage of Part 2 of the New York State Professional Engineers License examination, but in addition it is enjoying some use as a guide for study in preparing young engineering graduates for the Engineering-in-Training Certificate. It is also being used by several companies as a basis for refresher courses set up under company sponsorship. Expansion of the material over that in an earlier edition includes additional practice problems, an appendix embracing a table of engineering constants, a set of saturated ammonia and steam tables, and a Mollier chart for steam.

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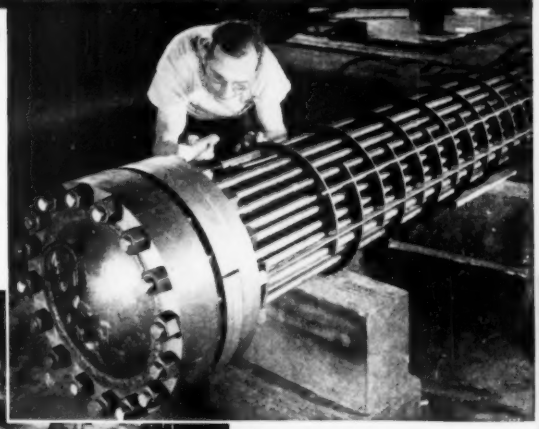

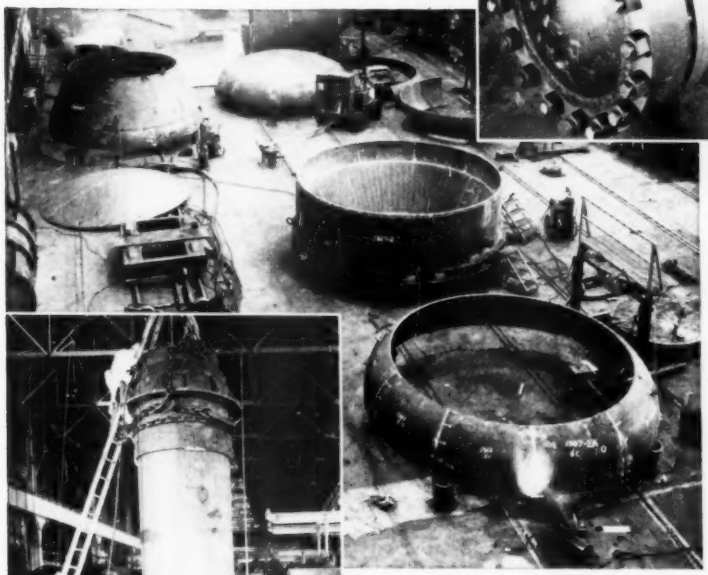

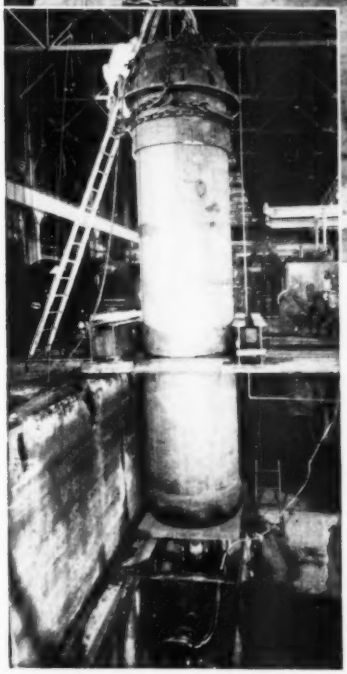

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Map of Turkey, showing location of Ramandag field, at present the only producing field in Turkey. The field has four wells

Turkey Schedules 10 Wells in Ramandag Field for 1950

A PROGRAM calling for probably 10 development wells in Ramandag field and initial work on the refinery and pipe-line projects during 1950 has been laid out by the Mining Research and Exploration Institute of the Turkish Government.

Ramandag with four wells at midyear is at present the only producing field in Turkey. Output of the field is rated at about 3,000 bbl. daily of 20° A.P.I. asphaltic crude, but the wells are not on continuous production. A pilot refinery plant and storage tanks are located near the railroad station at Batman, about 15 miles from the field.

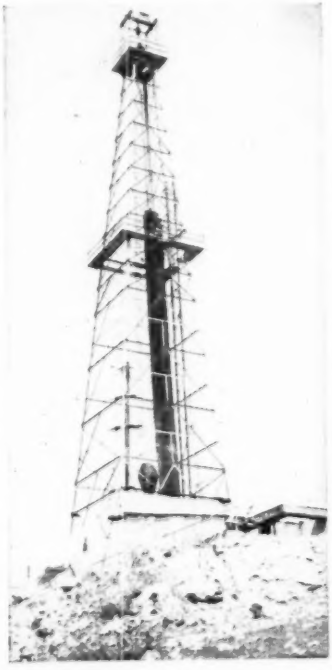
Three rigs now operating in the field are drilling at an average rate of three wells per rig per year. Purchase of new and modern equipment to accelerate the development work is under consideration.

According to officials of the institute, future activities at the field will be concentrated on two major objectives: (1) drilling more development wells in accordance with an accepted spacing program, to approach the goal of providing sufficient oil to meet Turkey's requirements; and (2) drilling more wildcat wells at geologically warranted locations in order to determine the extent of the field and obtain information for estimating of reserves.

In addition, the institute also plans to begin soon wildcatting operations in the Adana region on the Mediterranean Coast. The institute is in charge of oil operations in Turkey and is headed by Ihsan Ruhi Berent as director general.

The projected pipe line to give Ramandag a major outlet for its production would extend to the coastal town of Iskenderun. The intitute has been in contact with some American firms for assistance regarding the 20,000-bbl. daily refinery which is planned at Iskenderun.

The small home-made topping plant at Batman has a distillation capacity of 1,400 bbl. daily, and it is contemplated that a thermal cracking unit will be added to this installation. Also under discussion is the erection of a 5,000-bbl. daily refinery in the vicinity of the field. Both this and the Iskenderun refinery would be complete with catalytic cracking and other facilities, according to officials of the institute. Field gathering lines also are a necessary part of the program.



Rig in operation at Well No. 14 in Ramandag field

Ramandag production is obtained from about 1,300 m. (4,250 ft.) Two development wells with a total footage of 9,478 ft. were completed as producers the first half of 1949, and the program called for the completion of five more the last half of the year with a total footage of about 27,500 ft.

Small Area Proved

Ramandag structure has an indicated area of 40 by 7 miles but of this only 4 by 1 miles have been drilled and proved. One well, No. 14, was drilled below 7,000 ft. in order to test any possible deep oil horizons and to provide needed geological data on the underlying strata.

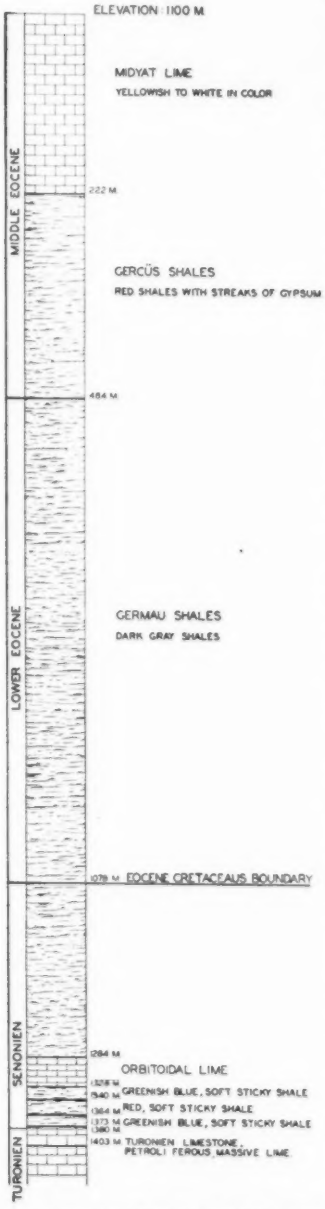
Various geological structures favorable for oil possibilities exist throughout Turkey, most of them being more of the obvious types such as anticlines, synclines, and monoclines, especially in the southeastern part of the country. Ramandag was discovered in 1948 but first drilling began in the area in 1939. These early operations were first confined to the Maymune Valley which is merely a perpendicular cut across the structure.

Several wells completed or partly drilled in this valley have later proved that the real and structurally high points, i.e., the crest of the anticline, lay further east beyond this valley, and thus plans were made and carried out to drill some more wells closer to the apex, as far as could be determined with the aid of surface geology.

The first well successfully completed under the new program was No. 8 which pumped at the rate of approximately 30 bbl. daily of heavy asphaltic-base oil from the Upper Cretaceous limestone. This well was pumped for about a year and a half, intermittently, while preparations were made for drilling another well along the crest, due east ¾ mile from No. 8.

The new well, No. 9, was swabbed from a depth of 4,000 ft. at a rate in excess of 300 bbl. daily. The well was then acidized and swabbed clean and later put to pumping. It has produced, though not pumped continuously, a constant amount of 420 bbl. daily for more than a year. Lack of larger sizes of pumps has prevented the operators from making a complete test and determining the exact daily output of the well.

Meanwhile, several more wells have been drilled through the pay zone in the Upper Cretaceous limestone, and the development program formulated. Ramandag can be described as an easy-to-drill area. The only obstacle that affects and increases drilling time is loss of circulation in the very cavernous surface limestone (of Eocene age) which has a thickness of about 1,000 ft. Proper control of the drilling fluid is the main item required in facilitating and accelerating the drilling operations.



Log of one of the field wells showing a portion of the Cretaceous pay. Lost-circulation zones are found in the Eocene limes

Twin Naphtha-Rerun Units

(Continued from page 58)

high-vacuum column, a reboiler system is employed. A vertical weir divides the bottom of the still into two sections. The weir overflow from the bottoms side is pumped through a steam heater.

A similer weir is built into the low-vacuum still but it is not being used to serve a reboiler. Liquid from both sides of the weir combine to form the charge to the high-vacuum still. The arrangement is provided for probable future needs. Since the column is stress relieved the addition of a weir at some later date would be a costly operation.

Gas oil leaving the high-vacuum tower carries with it excess caustic. To wash out this caustic, water is injected into the gas-oil stream. The water used is oil-free condensate that is taken from the boots of the reflux drums.

The liquids collected from the reflux drum boots are piped to a settling tank near the water tower. Flow from the tank is controlled by a water-oil phase regulator. Oil is returned to the high-vacuum column overhead and the water is injected into the gas-oil bottoms. Excess water is added to the water makeup for the cooling tower.

The gas oil, after cooling, goes to storage where the dilute caustic solution settles out and is drawn off. The gas oil is regularly sampled as it leaves the column and analyzed for caustic content. From these readings the amount of caustic being injected is controlled.

A Fluor forced-draft cooling tower supplies the cooling-water needs. Approximately 1,500 g.p.m. per unit is required. The tower has a built-in vibration protector device. Should vibration become excessive, a steel ball will be moved from its position of balance and shut down the fans.

The completion of these units is one more step in the expansion and modernization program of Standard Oil Co. of California. A new refinery is rapidly nearing completion at Bakersfield and construction will start in spring on additional refining and cracking facilities at Salt Lake City.

Contractor on the El Segundo units was C. F. Braun & Co. of Alhambra, Calif.

Port Jerome Refinery

(Continued from page 61)

continued. Most of the gas plant has been rebuilt; the lube rerun still has been reinstalled and the lube facilities modernized; the phenol-treating plant has been repaired and improved; a completely new asphalt oxidizing plant has been constructed. The boiler house was rebuilt, and the tankage repaired. Mechanical facilities at the refinery have been improved. Prewar, S.F.P. had plant for the manufacture of solvents and specialty naphtha solvents at Rouen. These facilities were destroyed during the war, and they have since been rebuilt at Port Jerome.

In the general rehabilitation of its battered refining industry, the French Government encouraged the policy of maximizing capacity as rapidly as possible, in some cases at the expense of product quality and selection. The entire French industry reached 90 per cent of its prewar capacity at the beginning of 1948. September 1949 imports of 1,005,188 metric tons of crude oil indicate a present processing rate of about 240,000 bbl. daily against about 180,000 bbl. daily in 1939. Another French refinery also burned and looted was the Gravenchon plant of the Socony-Vacuum affiliate located adjacent to Port Jerome. Parts of this refinery were scattered throughout Europe and a similar reconstruction policy has given this plant a throughput several times above its prewar 5,500 bbl. daily.

At Port Jerome, future expansion includes, besides plans for cracking facilities, the construction of propane dewaxing and deasphalting. Work on these units is scheduled to get under way in the next few months.

C.F.P. also is continuing work on the company housing in a project located a mile from the refinery. Known as Cite de la Petite Campagne, the area consists of about 200 dwellings of one, two, and four-family units, along with schools, a church, and other facilities. The project was started in 1935 and now provides for about 900 persons. Each unit has its own garden area, and the architecture is designed to harmonize with the surrounding Normandy countryside.

P.C.G.A. Issues 1949 Proceedings Report

The Pacific Coast Gas Association has recently published Volume 40 of its Proceedings (1949). Included are lists of officers and committeemen of the association, its leaders, and reprints of papers presented at the fifty-sixth annual meeting. The volume of 235 pages was compiled and edited by the managing director of the association, address of which is 447 Sutter Street, San Francisco.

Automatic PACKAGE UNITS for Dehydration

by A. W. Francis, Jr.,* and J. L. Maher*

GAS-TRANSMISSION-LINE pressures from 800 to 1,200 psi. are becoming quite common. Water-content requirements by the gas purchaser of 7 lb. of water per million standard cubic feet of gas and the attendant pressures of over 800 psi. have caused considerable emphasis to be placed on solid-desiccant-type dehydration since the liquid absorbtion type is limited to water-vapor dew-point depressions of 40 to 50 F. maximum.

Entrance of the gas producer into the field of gas dehydration, by encouragement of gas purchasers, caused attention to be centered on the need for an automatic compact dehydration unit. Since the cost of such units must be commensurate with large dehydration plants, on a per unit volume basis, standardization of sizes and types was considered a necessity.

In order to clarify our discussion of automatic package units for gas dehydration, we should like first of all to discuss seven principal requirements of such equipment. Then after the unit has been built, figuratively speaking, we should like to take up some of the factors which determine the unit's capacity and also discuss briefly some observations with respect to operation of these units.

Portability.—The first requirement is that of the unit's portability. It should not be overwidth, overheight, or overweight with respect to highway or railroad transportation.

To keep the maximum weight of the largest part of a compact dehydration unit within the legal weight limitations placed on trucking or that of just plain bad oil-field roads, we have found it advantageous not to make the desiccant towers an integral part of the skid unit. This is important in that the towers are the largest and heaviest parts.

Ease of erection.—The second requirement is that of the greatest facility in erection and dismantling which means specifically that as much of the piping as practicable should be shop fabricated to minimize field erection costs. Then too, inlet and outlet connections should be placed so as to permit manifolding or paralleling of units. Likewise, the unit should be so arranged that the on-skid piping and that which must be added off skids does not interfere with the desiccant towers and the accessibility of those towers.

Free of outside facilities.—The third requirement is that the unit should be of such a basic design so as to be free of outside facilities. This is important when dehydration equipment is to be installed in a remote location. In such installations the main gas stream provides the cooling of regeneration gas. This factor, as will be pointed out later, will restrict, in some cases the minimum amount of gas that a standard compact unit will handle without benefit of some outside cooling.

Automatic operation.—A very important requirement of a dehydration unit, operated in production service, is that the unit be automatic in operation. Where such units are a component of a process system as in the case of a gasoline plant, where manual attendance is already provided and is also necessary, automatic operation is far less important and desirable.

As applied to a solid-desiccant dehydration unit, automatic operation means time-cycle control of the tower switching, control of desiccant-bed cooling, and automatic control of regeneration-gas flow. It has become a practice on our part not only to time-cycle control the tower switching, but also to time-cycle control the desiccant-bed cooling as well. Bed-cooling control was once tried out on a temperature-sensitive basis, but subsequent experience indicates that the time-cycle control is more desirable for compact solid-dessicant units. Experience also indicates that the time-cycle control of tower switching and cooling should be done with a single timing mechanism having two cams on one shaft. This eliminates the necessity of synchronizing the clocks or timing mechanism.

The control of regeneration gas is accomplished by the use of a flow controller which actuates a motor valve in the main stream to create a differential pressure, thus causing a portion of the gas to flow through the regeneration heater. This practice is also common to even manually controlled dehydration plants. Since a solid-desiccant dehydration plant is usually unattended for long periods, such plants should be provided with suitable recording instruments. These serve as a guide to correct operating difficulties which may occur while the unit is unattended.

Ease of maintenance and operation.—Compactness should not be achieved at the expense of convenience of maintenance and operation. In other words the various parts of the dehydration unit should be so located that they are not difficult to service. As an example, the motor valves should be placed in groups so that they may be attended or removed without difficulty. The instruments should be placed so that they can be readily serviced. Last but not least the desiccant filling and emptying nozzles on the drying towers should be so located that filling and emptying operations will not be interfered with by the permanent piping. These nozzles should be located so as to permit ample working area around them. This space should be large enough to accommodate small trucks.

*National Tank Co., Tulsa. Paper presented at N.G.A.A. regional meeting, Amarillo.

Another factor which contributes to orderly operation of the dehydration unit is prevention of freezing during cold-weather operation. Experience has indicated that even in Texas and Louisiana Gulf Coast areas, protection of instrument piping on the wet-gas side, and the protection of valves and piping handling any liquid-phase water is most desirable.

Safety.—The safety requirements of a compact solid-desiccant dehydration unit do not differ greatly from those of any solid-desiccant dehydration plant, large or small.

For greatest safety, the heaters for regeneration gas should be of the indirect type. Experience has shown that most tube ruptures in direct-fired heaters are caused by sudden flow stoppage and the resultant overheating of the tube metal by the heat retained in the refractory material. Flow stoppage is caused usually by hydrate formation in the line going to the heater. Since a large portion of the compact dehydration units are installed as production equipment, and where facilities for controlling the inlet-gas temperatures are not provided, the indirect method of heating gas is believed to be imperative.

Two types of indirect heaters, one employing steam and the other operating with a high-melting-point salt, may be used. The heater employing steam consists of a furnace and a heat exchanger built in a closely coupled unit, so that the steam condensate returns to the generator by gravity. The salt-bath heater employs material which has a melting point of approximately 290° F. At temperatures below 800° F., the salt is said by its manfuacturer to be noncorrosive to mild steel. The salt-bath heater operates at essentially atmospheric pressure whereas the steam-condensing heater operates at a maximum of 300 psi.

In discussing the safety of dehydration units, we would like to encourage the good practice of not installing rupture heads or large-capacity safety valving on or very near a solid-desiccant tower. A sudden gas flow as could be created by such equipment causes considerable disturbance in the desiccant beds. A more desirable location for such equipment is in the piping upstream between the dehydration unit and the source of pressure; such as between the dehydration unit and the producing wells, or between the dehydration unit and a compressor station.

Factors Affecting Capacity

The volume of gas that a solid-desiccant unit of this type will handle is a function of the water content of the gas, the type of desiccant in service, the temperature of the gas in contact with the desiccant, and the relative humidity of that gas.

To show the effect of pressure and temperature of the volumetric capacity of a solid-desiccant plant, Fig. 1 has been prepared. This capacity chart indicates the effect of pressure and temperature for two types of desiccant. Our experience, and the investigation of others, indicate one factor that must be considered when using activated bauxite desiccants at temperatures of 90° and above. The percentage figures shown on the temperature lines of the capacity chart indicate the adsorptive capacity in per cent by weight used in calculating the gas capacities.

Activated bauxites display the characteristics of decreasing in adsorptive capacity as the temperature increases. On the other hand the siliceous-bead-type desiccant has displayed the characteristics of maintaining its adsorptive capacity at the higher temperatures. We have used this desiccant in saturated gas of temperatures up to approximately 120° F. and the figure of 7½ per cent weight adsorptive capacity is apparently reliable. Laboratory data supplied by the manufacturers of this desiccant indicate that the adsorptive capacity remains constant over a temperature range of 50° to 150° F. in saturated natural-gas service. This cost of the siliceous-bead-type desiccant is from two to three times higher than that of the activated bauxite. However, the capacity chart indicates its use is justified, particularly in the higher temperature ranges.

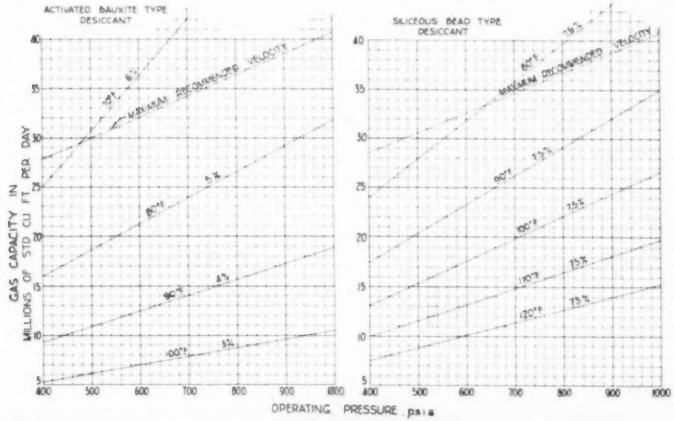

ACTIVATED BAUXITE TYPE DESICCANT
SILICEOUS BEAD TYPE DESICCANT
MAXIMUM RECOMMENDED VELOCITY
GAS CAPACITY IN MILLIONS OF STD CU FT PER DAY
OPERATING PRESSURE psia

Fig. 1—Capacity curves of a compact dehydration unit showing effect of pressure and temperature. Conditions: (1) gas saturated, (2) 48-in. o.d. by 15-ft. towers with 15,000 lb. of desiccant, (3) down-flow dehydration

In a number of large dehydration towers, the use of both the activated bauxite and the siliceous-bead-type desiccant in the same tower is said to offer advantages. In these cases, the activated bauxite is used as a buffer above and below the more expensive siliceous beads. All desiccants exhibit the property of reduced capacity at partial saturation ranging from a maximum of 100 per cent relative humidity to zero capacity in "bone dry" gas. Undersaturation is likely to occur when gas is to be dehydrated on a compressor station discharge where intercooler conditions vary widely.

One other limitation, shown on the capacity charts, is the maximum recommended velocity line. This has been calculated as the limiting mass velocities allowable without desiccant dusting and attrition. These values were calculated from the formula of Ledoux by applying a multiplying factor of 1.5 to correct for downflow velocities instead of the upflow velocities. Experience indicates that desiccant-bed dusting and packing can be alleviated by operating within the recommended maximum mass velocities.

As previously indicated these units using gas cooling of the regeneration stream have a minimum as well as a maximum volumetric capacity. This is due to the fact that the regeneration-heat requirement is essentially constant without respect to bed saturation. We have found that when the volume rate drops much below 50 per cent of the rated capacity, insufficient cooling of the regeneration stream occurs and water cycling between towers becomes excessive. When facilities permit, this difficulty can be eliminated by using some source of outside cooling.

Pressure Loss

Pressure loss is a matter of importance on any solid-desiccant dehydration plant whether it be a compact automatic type or a large permanent type. Pressure losses in gas transmission mean compressor horsepower. If pressure loss and the attendant compressor-horsepower requirements appear to be inconsequential because of high flowing pressure from producing wells, do not overlook the fact that before the property is depleted, compression will be necessary.

In an automatic plant the pressure loss in the valving can be held to a minimum by sizing and selecting the

proper type valves Single-seated valves are definitely an advantage, and because of the pressure-loss factor these single-seated valves should be of a high-capacity type.

The problem of minimizing pressure loss through the desiccant beds is a matter of keeping the mass velocity of the gas moving through the beds to what might be classified as the economical lower limit. Shallow or thin desiccant beds and large-diameter towers are naturally conducive to low pressure losses; however, in high-pressure installations the attendant increase in the cost of the towers is often prohibitive.

One quite successful approach to the problem of obtaining low pressure drop and low mass velocities in desiccant beds is that which we call the radial-flow-type tower (Fig. 2). On gas volumes in excess of approximately 20 million cubic feet of gas per day, these powers have definite application. On smaller gas volumes the conventional down-flow towers with desiccant-bed depths not exceeding approximately 8 ft., are quite ample.

In the radial-flow towers the gas for dehydration is brought into the annulus between the shell and the perforated cylinder within the shell at a point halfway between the upper and lower ends of the tower. As the gas enters the annulus it is diverted tangentially and carried around the perforated cylinder. Centrifugal force provides a separating action which removes liquid entrainment occurring because of the failure of the inlet-separator liquid-level controls or momentary overloading of the inlet separator because of abnormally high liquid rates, as often occurs in the gathering of wet gas. The gas then enters the desiccant through the perforated inner cylinder and flows into the center collector pipe and out the tower at its lower end.

When the tower is being regenerated, the gas flows into the center pipe and then through the desiccant to the annulus. The regeneration gas leaves the tower through an outlet connection that has its opening extending downwardly to the lowermost point in the bottom of the vessel. It is not necessary to insulate this type of drying tower, since by the time the gas reaches the outer shell, it is ready to be cooled.

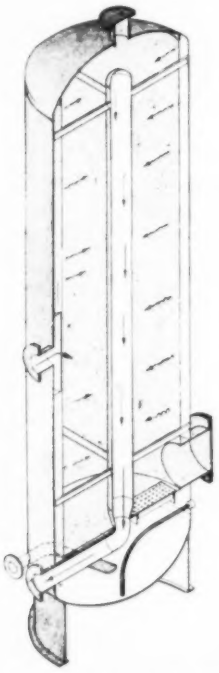


Fig. 2—Radial flow dehydration tower. (Patents pending)

Dew-Point Determination

One of the most important yardsticks of performance is the water-vapor dew point of the gas leaving the dehydration unit. In a good many cases considerable difficulty has been experienced in recognizing the water-vapor dew point of a gas with the standard Bureau of Mines dew-point tester. For relatively dry gases with respect to hydrocarbons, the Bureau of Mines instrument gives reliable and reproducible water-vapor dew points. However, as mentioned by the developers of this instrument, Deaton and Frost, in the presence of excessive amounts of condensables, the determination of a water-vapor dew point becomes more difficult and in many cases impossible.

New Tricks in Getting From Here to There

(Continued from page 45)

supports. Treadways can be used with trestle support columns and transoms to provide lengthy spans, and they can also be floated on rubber pontoons to provide any length floating bridge.

2. **Trestle.**—Trestles are used with the steel treadway to form a fixed bridge. A trestle consists of two columns and a cross-piece upon which the treadway rests. Bracing struts and cable are used to brace the steel treadway fixed bridge.

3. **Pneumatic floats.** — These large rubberized canvas floats can be used to support steel treadway in place of trestles. Thus a steel treadway float-type bridge is formed. Each float is 8 ft. 3 in. wide, 33 ft. long, and 33 in. deep and has a maximum displacement of 35,500 lb.

4. **Steel panel bridge (Bailey type).** —This is the famous British-developed wartime bridge that was used to such good effect by the Allies. It is designed to carry extremely heavy loads. The bridge is assembled on rollers, with a launching nose. It is then pushed or pulled across the obstacle to be traversed. Using the same parts, the capacity of the bridge can be varied within a wide latitude of loads.

5. **Steel pontoon barges.** — These barges consist of any desired number of steel pontoons held together by means of wooden sills or balk which are clamped to the pontoons.

6. **Pneumatic float-type barges.** — This type barge consists simply of a section of steel treadway float-type bridge as described earlier. It can be made up in any length desired and used in as little as 1½ ft. of water.

7. **Portable steel cube barges.** — These barges are assembled from steel pontoons that are actually specially constructed steel boxes. A number of pontoons are assembled into a row called "string" by means of four angle irons. Assembly angle irons up to 105 ft. long are available. They are secured to the four outside horizontal edges of the cube, both top and bottom. Curved-end cubes are then added and the strings are bolted together to complete the barge. The number of pontoons to a string and the number of strings attached to each other depends upon the kind or size structure being made.

8. **Steel panel roadway.**—The basic panel for this type roadway is 10 ft. long, 3 ft. 3 in. wide, and consists of three 4-in. I-beams 10 ft. long joined by welded braces. Perforated steel decking is welded to this unit to provide a road surface. The separate panels are locked into place by pins.

With the bridging equipment described above, Portable Bridge can handle a wide variety of jobs. These bridge jobs can be classified as follows:

1. Short-span bridges (spans less than 32 ft.) where no underneath supports are required.

2. A series of short spans with adjustable intermediate supports.

3. Floating bridges of any length—for use in deep water or areas where ground or stream bed will not support a trestle. Especially adaptable for use in areas isolated from normal floating equipment (barges, tugs, ferries, etc.) where material must be hauled in dismantled.

4. Continuous-span bridges with a single span from 40 to 180 ft. long.

5. A combination of any of the above types.

One of the most interesting jobs to date was for Gulf Refining Co. in the Atchafalaya River flood basin about 18 miles south of the Lake Charles-Baton Rouge highway near the town of Ramah, La. (See Figs. 6, 7, and 8.) A prospective drilling location had been staked in the Atchafalaya swamp 1 mile inside the east levee. Water level fluctuates as much a 14 ft. throughout the year—from complete dryness to a depth of 14 ft. There

are 2 months during the year when the swamp is completely dry. A borrow pit running alongside the levee remains full of water throughout the year. However, it isn't deep enough for ordinary barges or any normal water traffic to navigate. It is approximately 7 miles from the Atchafalaya River across the swamp to the location. Thus, digging a canal would have been a tremendous operation. The nearest accessible road is at Ramah and the location was approximately 1½ miles north of this town and then 1 mile west of the levee.

In addition to the terrain and weather, the problem of an approach to the location was further complicated by the necessity of protecting the levee and floodway from damage. U. S. Army Engineer regulations require that no piling be driven in the levee, no earth moved, or anything done to damage it. Earthen fills within the floodway area would prevent the floodway from doing the job intended for it. A trestle bridge was considered as a possible solution, but the distance involved (1 mile) would make this a very expensive operation. After considerable thought, it was decided that the only feasible answer was to barge equipment into the location. It also meant that any barge that was used would have to be hauled in by truck. Also, the barge must be towed by some type of craft that could be hauled in.

Two types of barges were furnished by Portable Bridge for the job. One was a pneumatic float type barge to handle the bulk of the ferrying, and the other was a steel pontoon barge with a wide deck to serve both for storage and as an auxiliary ferry barge. The tug was a fabricated steel boat that was hauled in by sections, reassembled, and then launched.

Access ramps from the levee to the barges had to be adjustable to take care of the 14-ft. fluctuation in water level. To solve this problem, an adjustable treadway ramp reaching from the levee to the borrow pit, approximately 360 ft., was installed. The canal to the location was dug to a depth of 4 ft. below ground level so that it would be filled with water all year. At the location itself all rig equipment was put on a piling foundation above the high-water level. Another ramp, similar to the levee installation, was built at the location to provide access from the barge to the piling platform.

The 2-month dry period was utilized to dig the canal, construct the access ramps, and install the piling platform at the location. The drilling of the well took 8 months during which time the water reached a depth of 12½ ft. Dismantling operations were carried out in 4 ft. of water, after the well proved to be a dry hole.

A second job of interest was for Humble Oil & Refining Co. in the North West Glendale area which is north of Trinity, Tex. A drilling location about 1 mile from Whiterock Creek had been chosen. The nearest road was 1,000 ft. from the creek on the opposite side. Any access from the location side would have required the construction of 11 miles of roadway. Hence, it was decided to bridge the creek.

Humble was using one of its largest rigs to drill this wildcat and needed a bridge that would carry a 70-ton load. Whiterock Creek is about 130 ft. from bank to bank, which is a little too wide for a continuous-span bridge of 70-ton capacity. Hence, two piers were built providing for a center span of 80 ft. and two end spans of 40 ft.

After the piling was driven, it took only 7½ hours to install a steel panel bridge using a dragline and 10 men. Another 3 days were required to align the bridge and to clear approaches. The wildcat was successful so after about a year of use for the rental structure, a permanent bridge was built using the same piers.

In Brushy Creek field of De Witt County, Texas, Housh Drilling Co. saved an 80-mile haul for one of its drilling rigs by the use of Portable Bridge equipment. Housh had already drilled one well in the field for Shell Oil Co. and the next location was across Brushy Creek about a mile away. There was an existing bridge across the creek, but it would hold only about a 5-ton load. A better road was available to get into the location. However, it was a distance of 80 miles on this route and, in addition there were several bridges of questionable strength involved. Engineers decided that the most economical solution was to put a bridge across Brushy Creek on the most direct route. Two days were required, from the time Portable Bridge started hauling material, to build a 150-ft. steel treadway bridge across Brushy Creek.

Another interesting installation was a crossing of Big Sandy Creek near Goliad, Tex., for the Great Lakes Carbon Co. At the point of crossing, the creek is about 300 ft. wide and the stream bed consists of highly unconsolidated sand. Normally, there is little water in it, but after a rain the water may be 3-4 ft. deep. To handle the situation, steel treadways were laid on the creek bottom. They were heavy enough not to be washed away and also would support the necessary load. In effect, the treadways formed a temporary ford. They were assembled on the creek bank and then pulled across with a tractor. One working day was required to make the installation.

In South Gillock field of Galveston County, Texas, Pan American Production Co. used portable bridging equipment to cope with the canals in this area. A recent extension of the field required that a well be drilled across a canal which was not bridged. A treadway trestle bridge did the job across this 70-ft. canal. (See Fig. 8.) This bridge was used to haul the drilling rig into the location. The next location proved to be back on the other side of the canal so a method was devised to save the drilling contractor (Harry L. Edwards Drilling Co., Houston) the expense of tearing down and rigging up again. Portable Bridge installed a section of steel treadway 24 ft. from the existing bridge to fit the rig substructure so that the rig could be skidded across the canal. It took only a half day to install this treadway section.

Conversion to Induced-Draft Operation

(Continued from page 47)

Following the working out of the details in connection with converting the tower, the tower supplier furnished a proposal whereby he agreed to perform all work in connection with the conversion of the tower to induced-draft operation for a fixed price with the exception of the cost of removing the old exterior surface of the original tower and the removal of the fill in the tower. This work was performed on a cost-plus basis in view of the indefinite amount of work which would be involved in the removal of the exterior surface and the tower fill.

Inasmuch as the entire cooling tower could not be taken out of operation for a period long enough to perform the conversion work, it was specified that only one-half the tower could be converted at a time and the work on the first half of the tower would have to be completed before work could be started on the second half. The conversion work was started about the first of May and required a period of approximately 2 months. Following the completion of the conversion of the tower, performance tests were made on the tower to determine whether the tower met the guaranteed conditions. These tests indicated that the cooling tower, when operating within the range of the performance curves, gave approximately ½° closer approach to the wet bulb than was required under the guarantee.

Final costs of all work performed in connection with the conversion of the tower to induced-draft operation show that the complete job, including all electrical work and painting the completed tower, amounted to $62,275.

The cost of the electrical installation including motor-controlling equipment, wiring, etc., was approximately $4,000, which, if omitted from the above figure, would leave a net cost for the actual conversion of the tower of $58,275.

QUESTIONS on TECHNOLOGY

by W. L. Nelson
Consulting Engineer

Chemicals Used by Petroleum Industry

What amounts of chemicals are consumed by the petroleum industry? We fully realize that this request is extremely broad and somewhat a hopeless one, and hence we shall appreciate any assistance.—M.J.H.

Although some information is available, the several sources do not check well with one another. In 1942 the Petroleum Administration for War surveyed the chemical requirements of the industry for the year 1941 and their results are summarized in Table 1 which was taken from Chemical Engineering, January 1946, page 139 (Chemical Requirements of the Petroleum Refining Industry).

TABLE 1—MAIN CHEMICAL REQUIREMENTS OF REFINING INDUSTRY 1941, POUNDS
(12 month consumption ending October 1, 1941)

Acetone	1,829,000	Inhibitors, misc., gasoline	2,400,000
Acetylene	552,000	Inhibitors, misc., oil	2,400,000
Acid, acetic	2,912,000	Lead naphthenate	101,500
Acid, fatty, mixed sources	1,400,000	Lead oxide	12,400,000
Acid, oleic	523,000	Lithopone	660,700
Acid, stearic	2,360,000	Methylethyl ketone	1,185,000
Acid, hydrochloric	1,780,000	Methyl dichlorostearate	411,400
Acid, isobutyric	85,000	Nitrobenzene	1,086,000
Acid, phenyl stearic	92,000	Oil, castor	118,000
Acid, phosphoric	1,300,000	Oil, coconut	207,500
Acid, sulfuric (100 per cent)	907,000,000	Oil, corn	412,000
Alcohol, ethyl	700,000	Oil, cottonseed	200,500
Alcohol, isopropyl	300,000	Oil, fish	227,000
Alpha naphthol	134,000	Oil, lard	5,560,000
Aluminum chloride	92,000	Oil, pine	670,000
Aluminum oxide	8,400,000	Oil, rapeseed	2,900,000
Aluminum stearate	555,000	Oil, rosin	525,000
Aluminum sulfate	3,900,000	Oil, soybean	133,000
Ammonia, anhydrous	4,856,000	Oil, sperm	1,420,000
Ammonia, aqua	6,800,000	Oil, tallow	18,200,000
Asbestos	424,000	Oxygen	2,310,000
Barium hydroxide	313,900	Phenol	4,137,000
Bauxite	10,000,000	Phenol, tertiary amyl	234,000
Benzene	3,720,000	Pine tar	248,000
Calcium carbide	3,227,000	Potassium hydroxide	1,064,000
Calcium carbonate	214,000	Potassium nitrate	785,000
Calcium chloride	5,113,000	Potassium phosphate	101,000
Calcium hypochlorite	244,000	Pyrethrum	2,553,000
Calcium oxide and hydroxide	51,000,000	Rosin	925,000
Calcium sulfate	398,000	Sodium aluminate	934,000
Carbon dioxide	1,147,000	Sodium bicarbonate	405,000
Carbon disulfide	463,400	Sodium carbonate	28,444,000
Carbon tetrachloride	1,240,000	Sodium chloride	33,770,000
Chlorine	3,300,000	Sodium dichromate	231,000
Chloroform	126,900	Sodium hydroxide	211,200,000
Chloronaphthalene	304,000	Sodium metaphosphate	644,000
Clay	274,000,000	Sodium nitrate	676,000
Copper chloride	260,000	Sodium phosphates	2,225,100
Copper oxide	246,000	Sodium silicate	496,000
Copper sulfate	948,000	Sodium sulfate	3,820,000
Cresol	3,400,000	Sodium sulphide	1,486,000
Dichloroethyl ether	404,000	Sodium sulphite	189,800
Dibutyl phthalate	586,000	Sodium sulphonate	700,000
Diethylene glycol	247,000	Sulfur	70,900,000
Dyes, misc.	396,000	Sulfur dichloride	2,048,000
Ethyl acetate	600,000	Sulfur dioxide	3,879,000
Ethylene dichloride	1,984,000	Sulfur monochloride	135,000
Fats, animal	2,200,000	Talc	2,200,000
Ferric sulfate	167,000	Tetraethyl lead fluid	77,000,000
Ferrous sulfate	659,000	Toluene	1,600,000
Formaldehyde	71,000	Tricresyl phosphate	696,200
Furfural	2,400,000	Turpentine	8,100,000
Glycerin	80,000	Water treating agents, misc.	1,183,000
Graphite	793,000	Wax, montan	450,000
		Wool grease	1,394,000

TABLE 2—ESTIMATE OF CHEMICALS USED IN THE PETROLEUM INDUSTRY IN 1947

Material	Pounds	Value
Sulfuric acid	540,000,000	$ 3,636,616
Catalysts	28,000,000	2,500,000
Fatty acids and tallow	———	2,400,000
Caustic soda	86,000,000	2,000,000
Clays for filtering	34,000,000	765,000
Phenol	6,500,000	750,000
Benzene	21,100,000	500,000
Ammonia	2,560,000	375,000
Methylethyl ketone	3,400,000	306,000
Sulfur dioxide	6,484,000	217,000
Phosphoric acid	———	100,000-200,000
Hydrofluoric acid	———	100,000-200,000
Litharge	———	100,000-200,000

The much lower figures given in Table 2 are those of E. H. Weaver (Chemical Engineering, December 1947, page 264) which were obtained by calling upon the seven major suppliers of chemicals. Weaver finds that 42½ to 45 million dollars were spent during 1947 for chemicals and that more would probably be spent in 1948. The breakdown for 1947 was somewhat as follows:

Chemicals for refining and manufacturing	$20,171,000
Gasoline and motor-oil additives and dyes	12,874,000
Field departments, chiefly mud chemicals	7,500,000
Specialty chemicals, including detergents	1,680,000

When operating for the production of 100-octane gasoline or the stocks from which it is manufactured, the relative amounts of the chemicals required are altered considerably from the figures shown in Table 1. An estimate of the chemical consumption of such refineries is given in the June 1946 article in Chemical Engineering.

Liquid Natural-Gas Fire

We are trying to locate information on a liquefied natural-gas fire that occurred several years ago. We refer to natural gas held as a liquid at a temperature of minus 100° or 200° F. —F. C. B.

The inquiry probably refers to the plant built by Hope Gas Co. and Peoples Gas Co. of Cleveland. It was constructed at a cost of about $750,000 in 1939-1940 and was described by R. W. Miller and J. A. Clark at the American Gas Association meeting at Atlantic City in October 1940. A flow diagram was published on the Questions on Technology page of April 24, 1941, page 73. The plant caught fire in October 1944 causing enormous damage. The fire was completely investigated by the U. S. Bureau of Mines, and the findings are discussed in: Report on the Investigation of the Fire at the Liquefaction, Storage, and Regasification Plant of the East Ohio Gas Co., Cleveland, October 20, 1944, U. S. Bureau of Mines, R.I. 3867.

In the plant, the gas was cooled by extensive heat (or cold) exchange, it was compressed, and finally a position of the liquid gas was allowed to evaporate for self refrigeration. For economy, two auxiliary refrigeration systems, one employing ethylene and the other ammonia, were employed. The ammonia was used to condense the compressed ethylene gas, and the ethylene was used to cool the compressed natural gas. The liquid natural gas was stored at minus 258° F. and at substantially atmospheric pressure. The purpose of the operation was the storage of gas during the summer so that peak loads could be handled throughout the winter.

No. 393

Flow Capacities of Wells

THE flow capacity of an individual well, whether it be an injection or producing well, is dependent upon many variables. The number of phases flowing in the reservoir, the formation properties, the geometry of the well-reservoir system, and the physical characteristics of the reservoir fluids all enter into the determination of flow capacity.

The operator of a field has no control over many of the factors. He does have control over the geometry of the well system imposed on the reservoir. One part of this is the size of bore hole drilled for the individual well. An exact mathematical formulation for the effect of this single variable cannot be written for any but a few simple cases, but qualitatively the flow capacity of a well is increased as the bore diameter of the well is increased.

There is a practical limit to the size of bore hole that can be drilled. In fact, the flow capacity cannot be changed markedly within the limits of the mechanical equipment available. For the steady-state radial-flow system, for example, the capacity is increased as the reciprocal of the logarithm of the ratio between drainage radius and well radius. For a well on 40 acres, a 6-in. bore hole would have to be increased to approximately 15 ft. to double its capacity. Means other than larger-sized bore holes are usually employed when it is necessary to bring the capacity of a well into a commercial range of production or injection.

The three principal methods of accomplishing this increase are (1) explosives, (2) acidizing, and (3) pressure parting. These are listed in the chronological order in which they have appeared as operating techniques. Each of these is a technique to break down zones of weakness through the reservoir formation, but each accomplishes this with a different form of energy.

Use of explosives is usually designed to fracture the reservoir rock, thus creating a pattern of fissures around the well bore. That this actually occurs has been attested to in small-scale experiments in surface outcrops and also by measurements on wells where explosives have been employed. Yuster[1] gives calculations to show by the increase in injection-well capacity that 6 and 8-in. bore holes were increased to effective radii of 14 and 33 ft. respectively. Such increases cannot be explained by the pulverization and removal of large amounts of formation. Pfister[2] gives measurements on bore-hole diameter for a shot injection well by which he shows no substantial increase in size of the bore-hole cavity over that of the drill bit. Thus, most experience points to the creation of fissure patterns by explosives. These fissures must penetrate to large distances in some instances in order to give effective radii of 15 to 30 ft.

It is generally considered that the effect of acidizing is to dissolve portions of the formation and thereby increase its permeability. Such a limited view fails to explain the large increases in well capacity often experienced as a result of acidizing. Acid also acts upon zones of weakness in a reservoir formation and sometimes because of the high acid-injection pressures that are used, the effect is to create a fissure pattern throughout the formation. The local intensity of such a fissure pattern is no doubt less than that due to explosives. Once such a fissure pattern has been formed, the individual fissures can be enlarged and made permanent by the action of acid.

The technique of pressure parting has been recognized only recently, although it has been practiced unknowingly for some years in water-injection wells and in the process of acidizing. In this technique the operator imposes a sufficiently high absolute pressure or rate of pressure buildup to break down hydraulically the zones of weakness within the formation. Here also the pattern of fissures is probably less intense than that due to explosives, and probably corresponds more to that resulting from acid treatment. With this technique there must also be some means of rendering the fissures permanent. In the current Hydrafrac process[3] this is accomplished by using a mechanical prop to keep the fissure open after it is once formed.

Techniques varying from the basic three mentioned are sometimes used. Explosives are applied, for example, by means of perforating tools in open hole, wherein the shot is concentrated at specified points within the formation. Acid may be used as a wash merely to remove extraneous material, such as drilling mud, from the formation.

Basic to the control of well capacity by any of these techniques must be an understanding of the formation conditions and of the desired objective. Broadly speaking, two different situations arise. There are reservoirs where good fluid communication exists throughout and the primary objective is to increase the bore-hole size to obtain increase in flow capacity. This would be typified by a homogeneous sandstone reservoir. A low penetration but high intensity of fissures would be most useful for this purpose.

There are those situations where good fluid communication does not exist throughout the reservoir because of heterogeneity of deposition or recementation. Typical of this would be a shaly sandstone with much lensing or a recemented dolomitic reservoir. In these instances the primary objective is to establish full communication throughout the reservoir by breaking down as many barriers to fluid flow as possible. A far penetrating fissure system would be most useful in these cases.

Basic also to the utilization of any of these techniques is the problem of well control. Unfortunately, once a fissure pattern has been created there is no acceptable technique for removing it in the event it is desired to rework the well. This has been stated to be one of the basic problems of well completions. Furthermore, in none of these techniques does the operator have sufficient control to prevent establishment of intercommunication between an oil zone and gas or water zones.

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3. Clark, J. B., Hydrafrac Process for Increasing Productivity of Wells, The Oil and Gas Journal, Oct. 14, 1948, p. 76. For data on 105 Hydrafrac treatments, see the Journal issue of Dec. 15, 1949, p. 42.

Series by Dr. John C. Calhoun, Jr., Chairman, Petroleum Engineering School, University of Oklahoma

How REED Super Shrink-Grip TOOL JOINTS

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Regardless of your location or drilling practice, Reed Super Shrink-Grip Tool Joints reduce your drill string costs. Here are some of the ways they can save you money:

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YOU SAVE if a tool joint is damaged by careless handling. Instead of having to send the length of pipe in to a shop, you simply replace the damaged joint *—right at the rig.*

YOU SAVE when drill pipe is bent or crushed. Instead of having to buy drill pipe with tool joints, you simply buy the drill pipe and transfer your Super Shrink-Grip Tool Joints to the new pipe at the rig.

YOU SAVE if you reverse ends of the pipe to distribute the wear from slips gripping the pipe. This practice, made feasable with Reed Super Shrink-Grip Tool Joints, greatly increases drill pipe life.

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AND YOU SAVE if tool joints wear out when pipe is still usable. By replacing Reed Super Shrink-Grip Tool Joints *at the rig*, you save the transportation costs of "shopping" your string for tool joint replacement.

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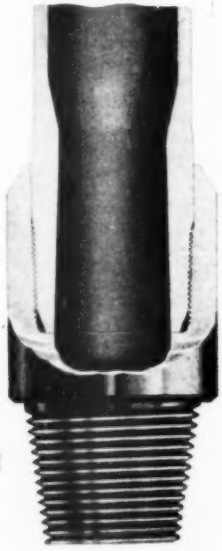
This combination of safety and economy has made Reed Super Shrink-Grip Tool Joints the first choice of leading operators everywhere. Ask your Reed representative for the full story.



THE MARK OF QUALITY

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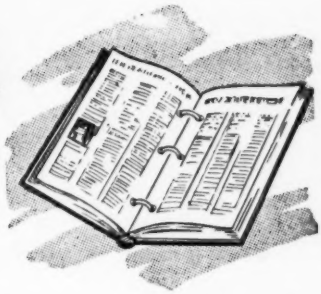
The Refiner's Notebook

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL



Refinery Loss Control

The current series of topics in The Refiner's Notebook begins with a discussion of refinery losses. Various aspects of a loss control program are considered, mostly from the operational viewpoint, in this and succeeding installments. Topics to follow are:

No. 2.—Calculation of Total Loss.
No. 3.—Storage Losses.
No. 4.—Gaging Methods.

THE basic step leading to control of losses in the refinery is, of course, identification and evaluation of individual loss sources. True total loss for the over-all refinery operation is obtained either through weight balance or by means of corrections to volumetric balances which allow for changes in state and density that occur during processing. It is then possible to establish a systematic control program to eliminate or minimize the losses. One or more of the technical personnel may be assigned to duties involving materials conservation and in the case of the large refinery or integrated oil company a loss-prevention committee may be organized.

Individual Loss Sources

Possibly the most difficult task on the operational level may be the location of the individual loss sources as, for example, leaks in underground lines. Accurate evaluation of individual losses provides, upon summation, a check against calculated total loss, indicates relative importance of the losses, permits formulation of control methods, and provides a check by which success of the conservation program may be measured.

Loss sources in the refinery may include:

Vaporization losses.—Loss of volatile constituents from both crudes and naphthas in storage (breathing and filling); spilling at loading racks; vaporization in waste-water separator; loss in blending gasolines or inadequate condenser cooling.

Measurement.—"Losses" (minus or plus) due to inaccurate or inconsistent measurement; complicated by mixing of outside finished products with refinery production.

Leaks.—From valves, lines, pumps, tanks, and process vessels.

Slops.—Oil in effluent from separators, loss due to separator emulsions; condenser and cooler leaks; removal of constituents in treating, e.g., as in caustic washing.

Processing.—Formation of carbon, sludges, etc.

Location of Losses

Evaluation of losses must begin with receipt of crudes and other stocks, continue with storage of these stocks, processing and intermediate storage, blending and finished storage, through shipment of products. Loading and unloading tank cars and tank trucks are observed, noting possible air entrapment and sidewall cling of heavy stocks. Losses which appear consistently and are related to accuracy of measurement of tank-car quantities is noted. In the case of storage, existing practice is checked closely to see that volatile products are stored in tanks designed for vapor saving, and for accurate and consistent daily routine in filling, emptying, gaging, and temperature measurements.

Leaks from pumps and valves have been greatly reduced through better sealing and other mechanical improvements. Education of operating personnel is still necessary with regards to such basic items as closing valves fully and tightening packings. Routine inspections for corrosion, daily check of plant pumping, and pressure tests on underground lines are of aid in locating leaks.

Loss-Control Program

When the individual losses have been evaluated, methods for control can be put into effect. These are often closely related to the maintenance program and will involve establishment of greater efficiency in the various processing operations. Steps may be taken to reduce slop production. Operation of the waste-disposal system is reviewed with the purpose of reducing losses by vaporization from separator surfaces. The whole program is designed for application to daily refinery operations, with provision for periodic and systematic check of losses in all departments.

Total Loss

In fixing the total loss modification of refinery accounting procedure is necessary. The refinery yield statement for a given month (volume basis) will not give the true loss since it does not account for changes in state during processing, such as formation of carbon and gases in cracking. The weight balance with adjustment made for inventory is the only criterion of real loss. However, with the possible exception of the small refinery, the additional procedures and facilities required to make an accurate weight balance make it impractical. For this reason it is necessary to devise an alternative method which will allow for processing changes in state and density. (Discussed in next installment.)

Economic studies are made through all phases of the program. This is done initially to indicate all possible savings, and at a later date to determine the "break even" point with regard to expenditures for loss control. This will then set the limits beyond which no attempt is made to control the loss. A "standard" loss is thus established against which future performance of the loss control program may be measured.

TABLE 1—COST OF OIL LEAKS
(See The Refiner's Notebook, January 1, 1948)

	Per day		Per month		Per year	
Rate—	Amt. (gal.)	Value*	Amt. (bbl.)	Value*	Amt. (bbl.)	Value*
One drop per second	1⅛	$0.06	0.8	$2.00	10	$25.00
Two drops per second	3¾	$0.22	2.5	$6.25	30	$75.00
Drops breaking into stream	24	$1.43	17	$42.50	204	$510.00
1/16-in. stream	84	$5.00	60.8	$152.00	730	$1.825.00

*At $2.50 per barrel estimated average crude price

STEVENS ZONE IN GOSFORD FIELD, KERN COUNTY, CALIFORNIA

Mud (Clay, Quebracho, Pyro):
R_m = 1.9 ohms at BHT
Bit size: 11"
Spacings: AM = 10"
AO = 10'
AO' = 19'

This is another in a series of interpreted electrical logs from identified formations and fields which Schlumberger will reproduce in this publication. If you would like to keep this entire series, please write to us on your letterhead and we will be glad to send you a reprint of this log (and preceding logs in this series) with a binder in which you may file subsequent logs as they are published. This series is made possible through the courtesy and cooperation of the oil operators who have released these logs.

LOG ANALYSIS

1) Water saturation S

R_o = 2 ohms at bottom of well.

The comparison of the different resistivity curves leads one to determine values for R_t respectively equal to 15 and 4 ohms in sections A and B.

In level A, $S = \sqrt{\frac{2}{15}} = 36\%$

In level B, $S = \sqrt{\frac{2}{4}} = 70\%$

2) Formation water resistivity R_w

With $SP = -70 \log_{10} \frac{R_m}{R_w} = -80$ mv.

(average of A and B Sands)

$R_w = \frac{1.9}{13.8} = 0.138$ ohm BHT, or 1400 G/G

3) Porosity p

$F = \frac{R_o}{R_w} = \frac{2}{.138} = 14.5$

$p = \sqrt[m]{\frac{1}{F}} = 22\%$ $\quad m = 1.8$

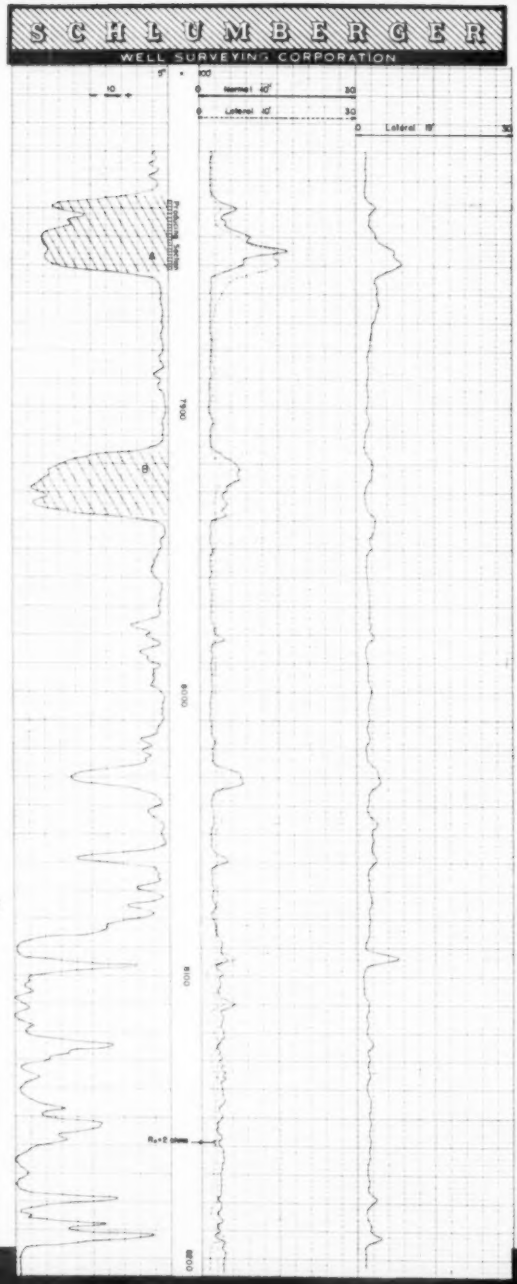
CORE ANALYSIS

Porosity: 22%
Water Salinity: 1400 Grains per Gallon maximum

PRODUCTION RESULTS

Producing Section: 7829-7853
Production Potential: 154 bbl./day 34° API, 0.3% cut

SCHLUMBERGER
WELL SURVEYING CORP.
HOUSTON, TEXAS



OIL AND GAS EQUIPMENT Digest

IT'S NEW CHECK IT

TRADE LITERATURE

1 THE TYPE "G" GAS ENGINE. A four-page folder describes all design and construction features, and includes schematic drawings of this water-cooled, four-cycle, medium-speed prime mover built in six, five, four, and three-cylinder units, rated at 180, 150, 120, and 90 hp. at 514 r.p.m. *Bruce-Macbeth Engine Co.*

2 PACKAGED POWER FOR LIGHT, AIR, AND WATER describes a combination unit of elastic design tailor-made to fit the demands for lights, air, and water of any drilling rig. *Louisiana Machinery Co., Inc.*

3 RUBBER, PROBLEM CHILD AMONG OUR BASIC COMMODITIES is an authentic presentation by P. W. Litchfield, chairman of the board, Goodyear Tire & Rubber Co., of the advantages and disadvantages of synthetic and natural rubber. *Goodyear Tire & Rubber Co.*

4 TUBE-FABRICATING TOOLS describes flaring, bending, and cutting tools for field and work bench fitting of flexible tubing. Also includes a list of warehouse addresses and sales offices. *Metal Goods Corp.*

5 12/54 AND 15/54 CC. PUMPING UNITS describes two pumping jacks having 54-in. polished-rod stroke. The 12/54 specifies a polished-rod load of 12,500 lb. and the 15/54 a load of 15,000 lb. The equipment is particularly compact in that the prime mover is mounted directly between the legs of the sampson post. Both units have an A.P.I. beam rating of 15,000 lb. *Le Grand Sutcliff & Gell, Ltd.*

6 KARRI-GO FRONT-BOOM INDUSTRIAL CRANE is a six-page brochure describing equipment that lifts, carries, and places loads of any weight up to 10,000 lb. Features short wheelbase, low height, and low center of gravity. *Silent Hoist & Crane Co., Inc.*

7 ENGINEERED BELLOWS-TYPE EXPANSION JOINTS. In addition to illustrations and complete engineering data on this line of expansion joints, the 20-page bulletin includes a table of thermal expansion of pipe in inches per 100 ft. *Magnilastic Division of Cook Electric Co.*

8 TWO-SPEED HANGER BEARING AND POWER DIVIDER is a four-page bulletin giving complete specifications, engineers' drawings, illustrations, and applications of this specialized equipment. *Tulsa Winch Division of Vickers, Inc.*

9 COMBUSTION CONTROLLERS includes a section on principle of operation, design and construction, applications, capacities and pressures, and a selection guide of equipment designed to give precise, automatic control in industrial processes utilizing heat. *Selas Corp. of America.*

10 300/400 AMP. DIESEL-ENGINE-DRIVEN ARC WELDER is a specification sheet on this trailer-mounted welder of British manufac-

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Corresponding to new equipment items or trade literature abstracts in the Oil and Gas Equipment Digest of The Oil and Gas Journal, Jan. 5, 1950

PLEASE PRINT

COMPANY NAME .....

STREET ADDRESS .....

CITY ..... ZONE NO. ..... STATE .....

NAME ..... TITLE .....

ture. This equipment is especially designed for use in oil fields and on pipe lines. *Murex Welding Processes, Ltd.*

41 STEELFLEX COUPLINGS, a four-page folder for loose-leaf binding, includes typical applications, and operational illustrations and descriptions of a coupling that fit practically all industrial requirements. *Falk Corp.*

12 VARIABLE DELIVERY OIL PUMPS. This well-prepared, multicolor, 10-page booklet presents a general description, construction details, methods of control of pressure and delivery, applications, and pertinent details on a range of sizes. *Fielding & Platt, Ltd.*

13 VALVES FOR GENERAL SERVICE. The bulletin describes and illustrates design and construction of these valves in detail, and explains their application to blowoff service and on fire protection, chemical process, water-column blowdown, and other types of pipe lines. *Everlasting Valve Co.*

14 C-60 CATALOG lists and illustrates the entire line of packers, bailers, sand pumps, and other equipment incident to secondary recovery. Convenient index and ordering procedure are included. *Larkin & Co., Inc.*

15 MODEL 80 TRENCHMOBILE is described in detail in an attractive eight-page catalog. One-man operated, the Trenchmobile is designed for fast and profitable handling of small digging assignments. It travels anywhere under its own power at rapid speeds. *Parsons Co.*

16 GEOFORMERS is a four-page bulletin illustrating, describing, and pricing geophysical transformers. These transformers embody designs based on years of specialization in this difficult field by pioneers in geophysical transformer design. *Triad Transformer Manufacturing Co.*

17 CORROSION-RESISTANT CEMENT CHART. A new complete chart showing the resistance of both resin and silicate cements to various corrosive chemicals is designd as a tool to aid the corrosion resistant masonry construction trade in selecting the proper cement for specific industrial uses. *Pennsylvania Salt Manufacturing Co.*

18 MASTERPLATE IRON-CLAD CONCRETE FLOOR. a new 36-page illustrated booklet, gives full information on the product and method which produce the features most important in industrial and commercial floors. *Master Builders Co.*

19 AIR SPEEDS TO YOUR MAP NEEDS. This 40-page book is a thoroughly interesting and instructive description of the science of photogrammetry, the science of obtaining reliable maps by means of aerial photography. Its many beautiful illustrations, among other matters, compare controlled mosaics to topographic maps of identical areas, methods of obtaining elevations, and matching of individual prints. *Jack Ammann Photogrammetric Engineers.*

20 DEAERATING HEATERS. The bulletin outlines the principles of deaeration; fully describes the design, operation, and applications of deaerating heaters; and explains their distinctive features. Both vertical and horizontal types of heaters are illustrated. *Graver Water Conditioning Co.*

21 BELL TUBING SWAB. An entirely new use for tubing swabs, to clean out drill pipe and to prevent pitting, is discussed in an illustrated eight-page folder. The swab when pumped down, removes the mill scale that forms inside of the drill pipe. *Mechanical Manufacturing Co.*

22 J. I. C. HYDRAULIC STANDARDS. The entire "Standards," as compiled and approved by the six coordinating groups of the Joint Industry Conference are reproduced in compact form in an attractive 16-page booklet. Standard symbols recommended are illustrated over two of the pages. *Miller Motor Co.*

23 OIL-FIELD CHAINS. This new book contains specifications, prices, diagrams, formulas, illustrations, and drawings on Rex and Baldwin Rex oil-field chains and sprockets and Baldwin-Rex flexible couplings. *Chain Belt Co.*

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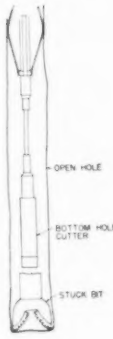
OIL AND GAS EQUIPMENT Digest

IT'S NEW CHECK IT

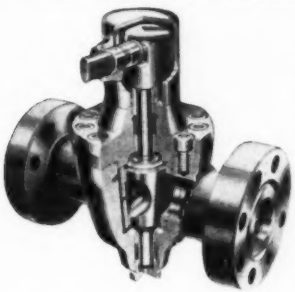
by Dan B. Miller

24 JET BOTTOM-HOLE CUTTER destroys or fragmentizes articles such as rock bits, reamer bodies, and slips in a matter of minutes, eliminating costly fishing operations or unpredictable nitroglycerin shots. The Jet Bottom-Hole Cutter employs the principles of focusing detonating gases to a beam, vertically, in such a manner that when the tool is positioned directly over an object or piece of junk in a well, the jet will cut the object into pieces in order that it may be drilled up, recovered, or pushed into the wall of the well bore. It is designed and arranged to be run with the McCullough electric service truck and to be fired from the electric control panel in the service truck. *McCullough Tool Co.*



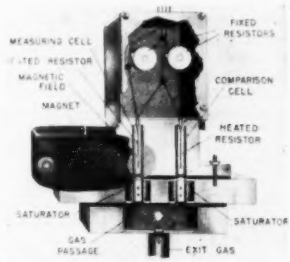
IT'S NEW CHECK IT

25 NONLUBRICATED LIFT-PLUG VALVE combines the advantages of recognized plug, gate, and globe valves, and eliminates the generally recognized difficulties of the standard valve designs. Need for lubrication is eliminated for two reasons: first, a complete seal is effected when the valve is shut, because a portion of the exterior surface of the removable seat is exposed to pressure, thus permitting a pressure-sealing action; and secondly, the plug is lifted straight away from the seat before rotation to prevent scoring or galling of the seating surfaces. Pressure-sealing action of the seat and plug forestalls many of the difficulties where distortion of the body due to pressure, temperature, or line strains cause imperfect sealing. The lift-and-turn mechanism incorporated in the valve makes possible an extraordinary ease of operation, since operating effort goes first into lifting the plug straight off the seat, then into turning it while free from contact with the seat, and, finally, reseating without rotation. *Cameron Iron Works, Inc.*



IT'S NEW CHECK IT

26 HAYS OXYGEN METER, called the Magno-Therm, is unique in that it operates on a new principle based on the paramagnetic property of oxygen. It continuously analyzes, indicates, and records the percentage of oxygen in boiler flue gases and in industrial gases. Gas to be analyzed is passed through a cell block in which there are two cells containing heated resistors. The sample gas diffuses into both cells. A strong magnetic field is directed across one resistor in the measuring cell. The oxygen-bearing gas is attracted into the magnetic field and becomes heated, loses its magnetism, and is forced out by cooler, more magnetic oxygen. The cooling effect on the heated resistor is proportional to the magnetism of gas entering the cell, changing its electrical resistance and increasing the flow of current through it. The change in flow of current is compared with the flow of current in the comparison cell resistor and the difference in resistance is measured. *Hays Corp.*



IT'S NEW CHECK IT

27 NEW FAST WORK BOATS are especially adaptable for personnel transportation, light towing, and general utility requirements of coastal oil fields, but are also available for pleasure uses. Present models have a

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

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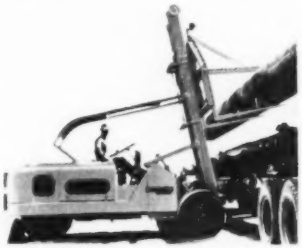
28-ft. hull with optional power and cabin arrangements; both single or twin screw, gasoline or diesel. One model is available with towing bitts. High quality construction has special emphasis on strength, stability, and seaworthiness. Boats are designed for fast performance in open or protected waters. *Safticraft Co., Division of Avondale Marine Ways, Inc.*

IT'S NEW CHECK IT

28 NEW EXPLOSIONPROOF SUMP PUMPS. The fully enclosed and explosionproof motor and switch used on the new series MC sump pump have Underwriters' approval for hazardous locations. These include atmospheres containing carbon black, gasoline, naphtha, alcohol, solvent vapors, and natural gas. This sump pump has a nominal capacity of 4,000 gal. per hour, and will operate a 23-ft. discharge head. Construction is copper and bronze throughout. Switch is controlled by an extra-heavy copper float, sliding freely on the supporting column. An adjustable stop governs water level at which the pump starts and stops. *Penberthy Injector Co.*

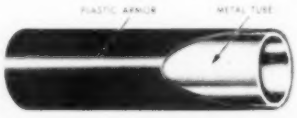
IT'S NEW CHECK IT

29 LIFT TRUCK WITH HYDRAULIC GRAB ARM. Hydraulic grab arm is designed to hold large and small circular material while traveling. There is positive hydraulic pressure on both the forks and the upper grab arm, making it possible to securely grip the load travel. Where pipe is laying on the ground, the forks will dig in under as the grab arm comes down to lock the pipe for lifting. The use of chock blocks and cradles is eliminated. The grab arm can be raised and lowered by conveniently placed fingertip control. The lift truck with this front-end mounted attachment successfully loaded 60-ft. sections of 34-in. steel pipe. *Gearlinger Carrier Co.*



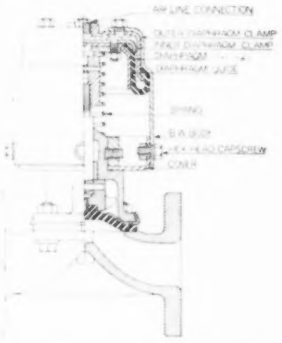
IT'S NEW CHECK IT

30 DEKORON TUBING is a new plastic armored metal tubing having high corrosion-resistant properties and designed for use as electrical conduit or for transmission of water, air, or gas. The new product consists of almost any thermo plastic, such as polyethylene, or cellulose acetate buterate, extruded over metal tubing of ferrous or nonferrous analysis. Virtually any color of plastic can be used for purposes of color coding. Life of the conduit in corrosive atmospheres is practically unlimited, since it is impervious to acids, and alkalies. Tests are currently being conducted for oil and gas pipe lines. *Samuel Moore & Co.*



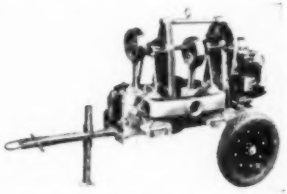
IT'S NEW CHECK IT

31 ACTUATOR. A lightweight, compact, and leakproof actuator for pneumatic or hydraulic operation. Benefits of freedom from product contamination, drop-tight shut-off, chemically inert linings and diaphragms, isolation of working parts, low pressure drop, and minimum simplified maintenance are featured with improved remote control. While pneumatic or hydraulic pressures up to 105 psi. may be used, usually only 50 lb. of actuating pressure is required to close the valve against 100-lb. pressure in the line being controlled. Pressure requirements will vary with the type of diaphragm required for the gas, liquid, or solution being handled. *Grinnell Co., Inc*



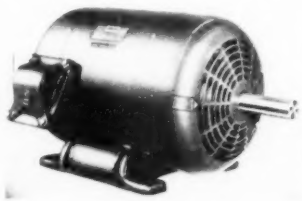
IT'S NEW CHECK IT

32 NEW DOUBLE DIAPHRAGM PUMP. Engineering, design, and construction of the new pump closely parallel that of the company's well-known single-diaphragm model which has proved successful in dewatering operations handled by public utilities, maintenance, and construction crews. Like the single-diaphragm pump, the new model handles muddy, or sand and debris-laden water. However, since one diaphragm is always pumping while the other is discharging, there is a constant flow which doubles the new pump's capacity. *Novo Engine Co.*



IT'S NEW CHECK IT

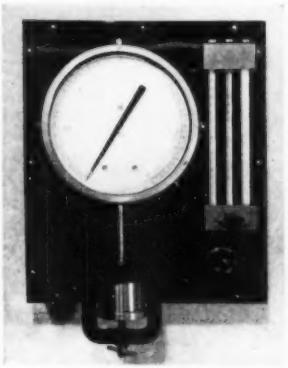
33 NEW EXPLOSIONPROOF LIFE-LINE MOTORS. New squirrel-cage, totally enclosed, type CSP, explosionproof motors are of heavy steel construction for resistance to corrosive atmospheres. Special primer, thermoset varnish, and nitrocellulose base finish are used. Prelubricated ball bearings provide effective lubrication without attention. No greasing program is necessary. These motors are designed for constant-speed-drive applications, such as pumps, blowers, or compressors, and may be safely used in any location where Class I and Group D explosive materials or atmospheres are encountered. They are available in frames 224 to 326, in 1 to



20-hp. ratings, for 2 and 3-phase, 25, 50, 60-cycle, 208, 220, 440, 550-volt service. *Westinghouse Electric Corp.*

IT'S NEW CHECK IT

34 GAS PERMEAMETER for determining the permeability of consolidated core section uses a rotameter-type flow meter to measure the flow of gas through the core sample. A triple-tube rotameter with selector valve is used to give the instrument a range of from below 0.5 to 4,000 md. No liquids of any kind are used in the flow meter or instrument, so that it may be transported in any position without making it necessary to refill or recheck. *Ruska Instrument Corp.*



IT'S NEW CHECK IT

35 ALUMINUM CASING is now available for use in seismograph shot-hole drilling. This casing weighs about one-third as much as steel casing and will not rust or corrode. It has been tested in the field by a major company which found that instead of seven men on a drilling crew, two or three men could do the job by using aluminum pipe. Company also reported that chain

tongs do not crimp the aluminum pipe nor do the threads become battered. Threads have the further advantage of not rusting or corroding and are easy to make up. The pipe is being made in 10-ft. lengths with a 3½-in. outside diameter. Each joint weighs 8 lb. A complete line of auxiliary equipment, from aluminum, is also available. This equipment includes loading poles, disconnect subs, pipe tongs, and bits. This equipment is easily carried by men on foot or in light aircraft, as shown above. *Aluminum Pipe, Inc.*

IT'S NEW CHECK IT

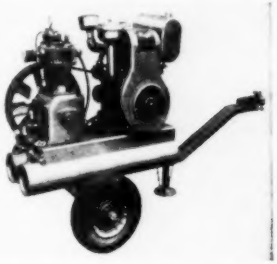
36 SANTOLENE C is a new rust inhibitor for light-oil products in pipe lines and static storage. A hydrocarbon-soluble, water-insoluble, nonmetalic organic material, it is intended to be used in such products as gasoline, fuel oil, and kerosine. The new product is sufficiently effective at a dosage of 0.002 per cent by weight, or 0.75 gal. per 1,000 bbl. when tested against distilled water. Concentrations up to 0.01 per cent may be necessary against sea water. Treating cost with Santolene C at 0.002 per cent with a displaced fuel credit of 10 cents per gallon, is said to be about 0.14 cents per 42-gal. barrel. *Monsanto Chemical Co.*

IT'S NEW CHECK IT

37 FILTER REGULATOR combines filtering and pressure regulating in one compact unit only 11 in. high. It is designed for use with air and any noncorrosive gas at pressure up to 125 psi. and ambient temperatures up to 120° F. It is recommended as original equipment on production machines and as plant equipment for instrument control and general industrial air-line use. Filter has directional inlet which creates centrifugal action, throwing moisture and entrained solids against bowl, where they run down into a quiet zone beneath the baffle. Screen of reinforced 200-mesh Monel wire removes remaining solids. *C. A. Norgren Co.*

IT'S NEW CHECK IT

38 TRAILER-MOUNTED PORTABLE COMPRESSORS. Designed especially for operating small air tools on service jobs, these new compressor units are ideal for public utilities and industrial plants. Their capacity is ample for operating paint spray guns, light paving breakers, spaders, tampers, and similar pneumatic equipment. Units are furnished complete with air-cooled compressor, with V-belt drive to gasoline engine, mounted on a sturdy pipe tank type base. It is equipped with semipneumatic rubber-tired roller-bearing wheels, drawbar, trailer hitch and stabilizer leg. *Gardner-Denver Co.*



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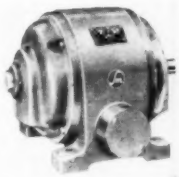
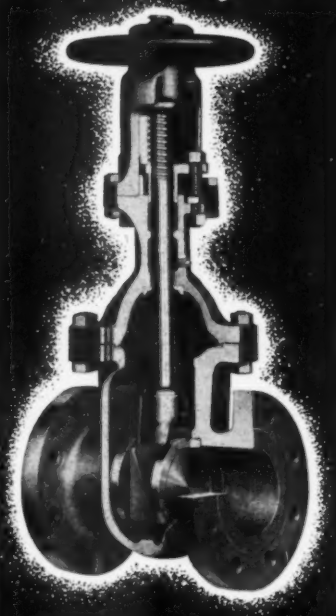


39 SPLASHPROOF MOTOR is designed for locations which are subject to direct streams of water or other liquids. This motor may be mounted in any position and will keep its splashproof features. The end bells permit free passage of ventilating air through integrally cast baffles, preventing splashing liquids from reaching the interior of the motor. The air is drawn through the rear of the motor and exhausted through the shaft end, thereby blowing away foreign materials, water, and liquids from not only the motor, but also the assembly it is driving. *Sterling Electric Motors, Inc.*

How Darling features prevent trouble and expense



GREATER SERVICE LIFE

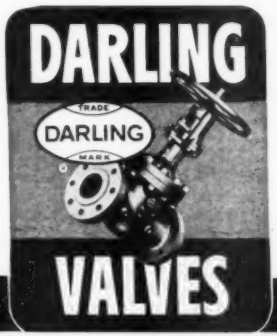
EXPERIENCED valve users know that the value of a valve is not determined by its price tag but by its service life, reliability, and the amount of maintenance and down-time necessary to keep it in operation. To assure greater service, the following advantages are combined in Darling's unique Fully Revolving Double Disc Parallel Seat Gate Valves:

1. **Discs do not wear unevenly.** Free to revolve completely, the discs seat in a different position at each closing, thereby multiplying the effective life of both discs and body seats.
2. **Face-to-face contact seating.** In closing, the discs are directly opposite the seat faces before wedging action takes place. In opening, wedging pressure is fully released before *either* gate starts to rise.
3. **Automatic adjustment for body distortion.** Diagonal face of upper wedge is curved and lower wedge face is straight; both faces are transversely beveled, to equalize wedging pressure against discs and permit tight 360° seating despite any misalignment of seats.
4. **Destructive strong-arm methods unnecessary.** Above features entirely eliminate need to "jam" valves shut or "break" them open.
5. **Advanced metallurgy.** Unusually rigid control and advanced methods provide castings that are superior to ordinary castings in strength, density, pressure-resisting characteristics, and in resistance to abrasion and corrosion.

To obtain greater valve life and trouble-free performance, be sure to specify Darling Fully Revolving Double Disc Parallel Seat Gate Valves.

DARLING VALVE & MANUFACTURING CO.
WILLIAMSPORT 1, PA.

Outline your service requirements and get complete information on Darling Valves of the proper type. Or, send for the complete 300-page Darling Catalog No. 17M. It describes Darling Valves of all types for every normal or unusual service, and for pressures up to 1500 pounds. It's full of helpful information... Yours for the asking.



"This advertisement is one of a series showing how the unique Darling Fully Revolving Double Disc Parallel Seat Gate Valves answer the following critical operating problems:

- Positive, easy closing—regardless.
- Automatic adjustment for valve body distortion.
- Elimination of disc-to-seat friction and galling.
- Uniform wear distribution.
- Extreme simplicity.
- Greater service life.
- Simplified maintenance

CORROSION RESISTANT VALVES

In addition to conventional iron, bronze and steel constructions, Darling specializes in valves for any corrosive fluid: iron body valves with special alloy trim; iron body, rubber lined, with special alloy trim; all bronze; and all special alloy. Darling's 30 years of experience in meeting unusual requirements is always at your service.

THE VALVE MARK OF QUALITY . . . WATCH FOR IT

PIPE LINES

Great Lakes Contracts for Tulsa-Kansas City Line

Great Lakes Pipe Line Co. has awarded contract to Pacific Pipe Line & Engineers, Ltd., for construction of a 12-in. products pipe line from Tulsa to a point on the south bank of the Kaw River, approximately 4 miles from Kansas City, Mo. Length of this project will be approximately 236 miles.

A contract for laying a 54-mile, 12-in., Ponca City-Barnsdall, Okla., line has been scheduled for letting this week. The Oklahoma-Kansas City undertaking totals 290 miles of 12-in. to parallel the existing system consisting of three 8-in. lines between Barnsdall and Kansas City, an 8-in. Ponca City-Barnsdall line and a 6-in. and an 8-in. between Tulsa and Barnsdall.

To meet the March 1 completion date, Pacific is putting four spreads in the field this week. Two spreads are operating from a Tulsa field office; the other two spreads are based at Bartlesville, Okla., and Paola, Kans.

Other Great Lakes authorized projects which have not yet been contracted include: (1) Kansas City through Omaha and Sioux City, Iowa, to Sioux Falls, S. D., 355 miles, 12-in.; (2) Kansas City to Des Moines, 189 miles, 12-in.; and (3) Cushing-Drumright-Tulsa, 50 miles, 8-in.

Great Lakes construction is now in progress for the Des Moines-Minneapolis 250-mile, 12-in. line contracted by Williams Brothers Corp., Sheehan Pipe Line Construction Co., A. C. Holder Construction Co., and O. R. Burden Construction Co.

Work completed in 1949 for Great Lakes includes a .745-mile, 12-in. Mississippi River crossing by Williams Brothers and a .427-mile, 12-in. Des Moines River crossing by O. R. Burden. Both of these were finished late in November.

Northern Natural Contracts 597 Miles of Looping

Northern Natural Gas Co. has awarded contracts to R. H. Fulton & Co., Midwestern Constructors, Inc., and R. B. Potashnick for a total of 597 miles of looping in 10 sections from the Texas Panhandle to northern Iowa. In addition to these loops the company is now laying a 23.7-mile lateral, contracted by Fulton, consisting of 3.7 miles of 24-in. and 20 miles of 20-in. to extend from its Sublette, Kans., station to a connection with Plains Natural Gas Co. in the Oklahoma Panhandle. In connection with the Northern Natural expansion program 40,000 compressor horsepower will be added for raising capacity by 130,000,000 cu. ft. from the present 470,000,000 cu. ft. to a total of 600,000,000 cu. ft. This entire Northern Natural expansion program is subject to approval by Federal Power Commission which will consider the program at a hearing on January 9.

Arrangements have been made for pipe deliveries so that work may start at the Texas end of the looping project in March. Completion is scheduled for October 1. The 10 loops of Northern Natural to parallel the present system have been contracted as follows:

R. H. Fulton & Co. has loops Nos.

Handling of 31½-ft., 30-in. joints in lining up for running stringer bead in advance of automatic submerged arc welding for double jointing at a Shamrock Construction Co. yard operated to furnish pipe in the form of 63-ft. joints for the Transcontinental Gas Pipe Line Corp. Texas-New York line; being built under the direction of Fish Constructors, Inc.

CRC

PIPE LINE CONSTRUCTION EQUIPMENT

CRUTCHER-ROLFS-CUMMINGS, INC.
Pipe Line Equipment and Materials
Houston - Tulsa

CLEVELANDS
FOR
MINIMUM TRENCHING COSTS

● CLEVELANDS rugged unit construction and fine engineering cut maintenance cost to a minimum and permit quick, easy field repairs. Their low fuel consumption cuts operating cost to rock bottom.

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20100 ST. CLAIR AVE. • CLEVELAND 17, OHIO

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PIPE COATING and WRAPPING MACHINES
Stationary and Line Traveling

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Boyd is one of the largest distributors of International industrial machinery west of the Mississippi.
CLARENCE L.
BOYD
CO.
TULSA, OKLAHOMA

1 to 5 inclusive: Loop No. 1 extends 40.2 miles, 26-in., northward from a point 28.7 miles north of the Skellytown station in the Pampa, Tex., area; Loop No. 2 Beaver, Okla., station 74.9 miles, 26-in.; Loop No. 3 Mullinville, Kans., station 33¼ miles, 26-in.; Loop No. 4 Bushton, Kans., station 72½ miles, 26-in.; Loop No. 5, from a point west of Garden City, Kans., to Bushton, Kans., station, 155 miles, 20-in.

Midwestern Constructors, Inc., has loops Nos. 6 and 7: Loop No. 6, from a point 29 miles northeast of Palmyra, Neb., station 43.4 miles, 25-in., to Oakland, Iowa, station; Loop No. 7, from a point 17.8 miles northeast of Oakland, Iowa, station, 65.9 miles, 26-in.

R. B. Potashnick has loops Nos. 8, 9, and 10: Loop No. 8, southwestward from Ventura, Iowa, station 31.2 miles, 26-in.; Loop No. 9, northward from Ventura station, 41 miles 26-in.; Loop No. 10, from the north end of a 26-mile gap beyond Loop 9, another loop will be built consisting of 39½ miles, 26-in. These loops will be installed on the "second" and "third" lines of Northern Natural. The 40,000 compressor horsepower will be installed in 25 units of 1,600 hp. each.

Two new stations in Kansas will be built this year: (1) One near Garden City with two units; (2) the other near Liberal, with three units.

At existing stations, units will be added as follows: two units each at Beaver, Okla., and Mullinville; three units each at Sunray, Tex., Bushton, Kans., Clifton, Kans., and Palmyra, Neb., and four units at Beatrice, Neb.

Tennessee Gas Transmission Has 1,625-Mile Program

Tennessee Gas Transmission Co. has a 1,625-mile construction program, for which 136 miles is now under construction at four sections contracted as follows:

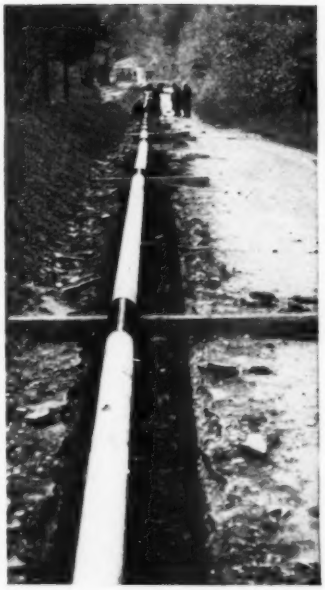
1. Morrison Construction Co. from White Bluff area to Joelton, Tenn., area 54.2 miles, 30-in.

2. Morrison Construction Co. from Glasgow, Ky., area to Joelton, Tenn., area 36.1 miles, 30-in.

3. Anderson Brothers Corp., from near Union City to Buckeye, Ky., 18.1 miles, 30-in.

4. Massey Construction, from near El Campo, Tex., to near Traitor, Tex., 27.7 miles, 12-in.

The principal projects which have been authorized but not yet contracted by Tennessee Gas Transmission include the 395-mile, 26-in. extension from Load, Ky., to the Buffalo, N. Y., area; 707 miles of 30-in. looping from



It Pays to Specify
TAPECOAT*
. . . The Modern Protection for Pipe Joints, Service Connections, Mechanical Couplings, Large Bends and Large Diameter Pipe

TAPECOAT . . . the *coal tar* wrapping in handy tape form is the practical answer to engineers in solving many corrosion problems. Available in widths from 2" to 24", it's the one handy coating you can use right down the line from the smallest to the largest jobs and provide protection equivalent to the mill coating on the pipe. It's easy to apply TAPECOAT. The small widths are spirally wrapped . . . the large widths are cigarette-wrapped. No dirt. No mess. You save time, work, material and money.

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New York Office
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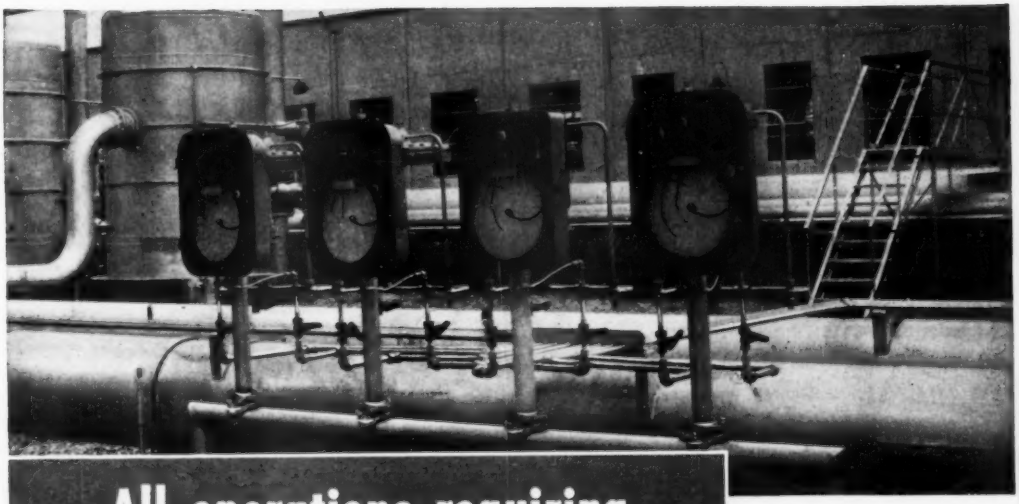
Houston Office
Jas. E. Mayor Co.
514 M & M Bldg., Houston 2, Texas
Denver Office
175 Niagara St., Denver 7, Colo.

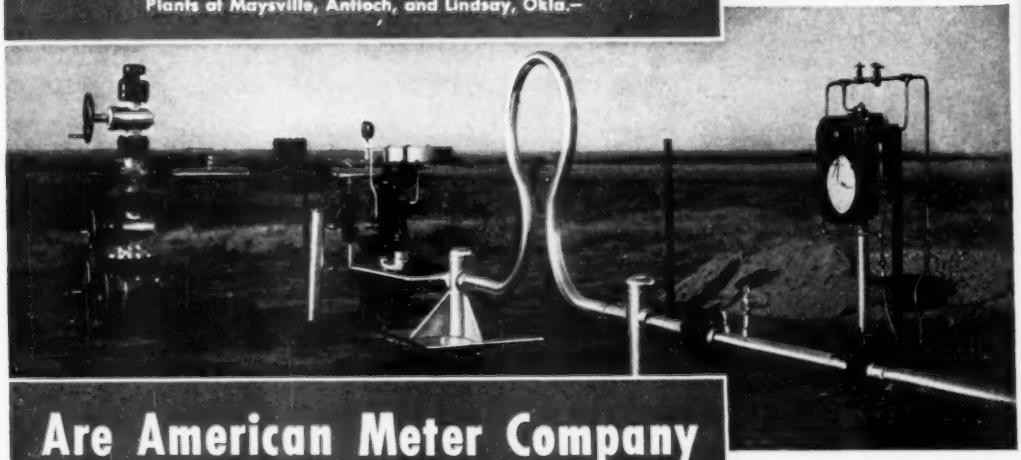


All operations requiring Orifice Meters

(APPROXIMATELY 300)

At the Ultra-Modern Warren Petroleum Company Plants at Maysville, Antioch, and Lindsay, Okla.—

Line-up of American Meter Company Orifice Meters Measuring Gas from the Field to the Plant.



Are American Meter Company Metric Orifice Meters

"American" Metric Orifice Meters are used as Standard Equipment by numerous companies including many other Warren Petroleum Company Plants.

One of "American's" 2500 lb. W.P. Metric Orifice Meters on Station Input or Injection Well.

AMERICAN METER COMPANY

INCORPORATED (ESTABLISHED 1870)

60 East 42nd Street • New York 17, N. Y. • Albany • Alhambra • Atlanta • Baltimore • Birmingham • Boston • Chicago • Dallas • Denver • Erie • Fort Lauderdale • Houston • Joliet • Kansas City • Los Angeles • Minneapolis • Odessa • Philadelphia • Pittsburgh • San Francisco • Tulsa • In Can.—Canadian Meter Co., Ltd., Hamilton, Ont.

CROSE

Pipeline

EQUIPMENT
MATERIALS
SUPPLIES

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CROSE
MANUFACTURING CO., INC.
2715 Dawson Rd. — Tulsa, Okla.
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South Texas to eastern Kentucky; 32 miles of 24-in. looping in South Texas; and 52 miles of 26-in. looping in eastern Kentucky. A 44-mile, 16-in. lateral will be built in Pennsylvania and 263 miles of various diameter gathering lines in Texas and Louisiana.

During 1949 the company laid 492.98 miles including 372.3 miles of mainline loops and 120.68 miles of gathering lines. Construction was handled by seven contractors with the exception of 106.11 miles laid by the construction organization of Tennessee Gas Transmission.

Plains Natural Starts 78-Mile Hugoton Project

Plains Natural Gas Co.'s 78-mile gathering system in Oklahoma and Kansas areas of the Hugoton field is being built by Arey-Phillips Construction Co., Amarillo, Tex. Unloading and coating has been contracted by Tulsa Pipe Coating Co. Midwestern Constructors, Inc., which handles engineering and inspection for the Plains Natural project, will be represented on the job by Lyle DeWitt.

This project is being built for transmitting gas to a connection with Northern Natural Gas Co., which will be made by January 30. The entire 78-mile system of Plains Natural is scheduled for completion March 31.

This is the first step in a program for the laying of approximately 200 miles of gathering lines. Plains Natural is engaged in a drilling program to increase its present wells from 63 to an ultimate total of 181.

Extra Work for Montreal Line Contracted by Latex

Portland Pipe Line Corp. and Montreal Pipe Line Co., Ltd., have contracted with Latex Construction Co. of Georgia for additional work items in connection with the construction of the 236-mile, 18-in. looping project which is to start in May for scheduled completion in November 1950.

The Latex jobs for the project include a 3-mile, 30-in. discharge line from the South Portland terminal to the tank farm, piping including two outside manifolds at South Portland tank farm; station piping and manifolds at South Portland, North Waterford, and Lancaster; Richlieu, and St. Lawrence River crossings in Canada, and delivery piping at Montreal East, Que.

The 18-in. project has been contracted at the United States end with Oklahoma Contracting Co. for Section 1, 85 miles, with Associated Pipe Line Contractors, Inc., for Section 2, 81 miles; and at the Canadian end with Fred Mannix & Co., Ltd., for Section 3, 68 miles.

Years of experience and specialization, combined with a well integrated organization, result in more efficient pipe line construction.

CONSTRUCTION CO.
General Contractors
Oil • Gas • Gasoline • Water Pipelines
HOUSTON, TEXAS ATLANTA, GA.
L. H. Favrot — G. A. Peterkin — J. W. Sharman

"ARMSTRONG BROS." Chain Tongs come in "Standard", "Reversible Jaw" and "Ideal" (V-jaw) types—in sizes for every need. Their drop-forged jaws have milled teeth, are hardened, tempered and tested for wearing qualities. They have heavy forged-in lugs that give extra bearing on the handles to which they are rigidly held by a large hardened steel bolt. The handles are forged and heat treated to the correct balance of stiffness and spring. Shackles are drop forged and chains proof-tested to ⅔ catalog strength (3,600 lbs. to 40,000 lbs.)

Write for New S-48 Catalog, just released.

ARMSTRONG BROS. TOOL CO.
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New York
and
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S. E. HUEY & CO.
ENGINEERS & SURVEYORS
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PIPE LINE SURVEYS

moving?

If you are moving be sure to notify THE OIL AND GAS JOURNAL at least three weeks in advance. When writing, give both old as well as new address. . . . Just clip mailing label from The Journal, indicate new address and mail to

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Box 1260 — Tulsa 1, Okla.

PERFECTION IN CONTROL *for well head service*

FOR PRESSURES TO 15,000-LB TEST
CORROSION-RESISTANT
REPACKABLE UNDER PRESSURE
POSITIVE PRESSURE-SEALED PORTS
UNEXPOSED SEAT

NORDSTROM VALVES

...now automatically lubricated with

Hypermatic
Trade Mark

Keep upkeep down

Ask for Hypermatic Lubricant Bulletin V-211

Nordstrom Valve Division—ROCKWELL MANUFACTURING CO.

ROCKWELL

400 North Lexington Avenue *Pittsburgh 8, Pa.*

Atlanta, Boston, Chicago, Columbus, Houston, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco, Seattle, Tulsa and Leading Supply Houses. Export: Rockwell Manufacturing Co., International Division, 7701 Empire State Building, New York, New York.

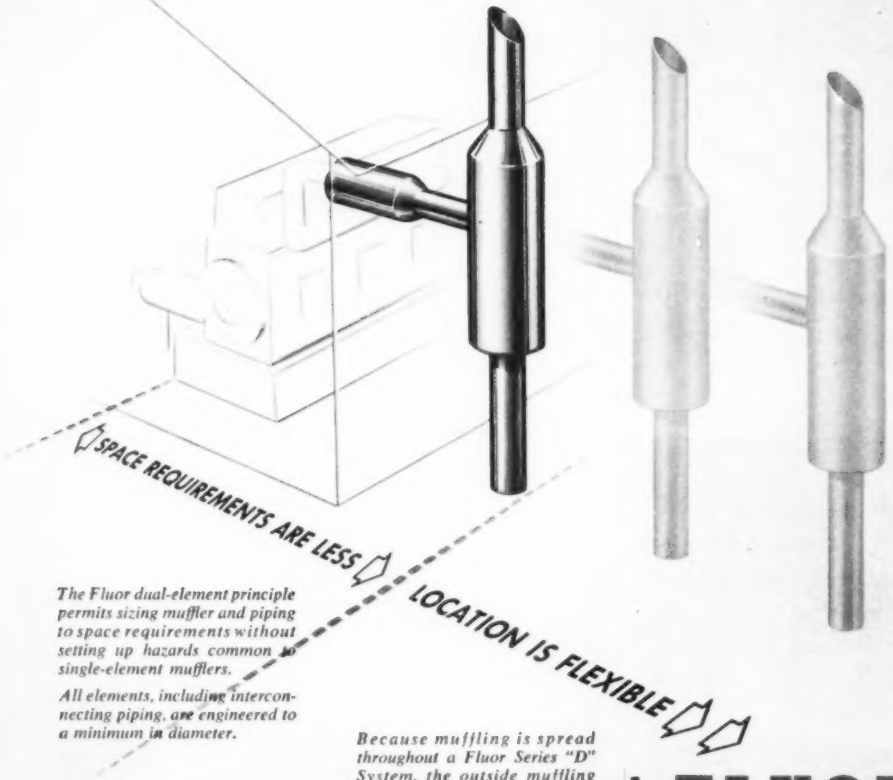
See for yourself...

the installation advantages of a FLUOR SERIES "D" MUFFLER SYSTEM

The reason lies in the unique dual-element design of this muffler *system*. Work is started on pulsative exhaust gases *at* the engine—noise and pulsation reflections are virtually eliminated *at* their source. The Fluor Series "D" Muffler is a *system* that incorporates *two* muffling elements—a primary element located in the immediate proximity of the engine and a secondary element located *at any desired spot* outside the engine room.

The Fluor Series "D" Muffler System is the answer to your muffling problems. In addition to installation flexibility it provides the highest muffling efficiency obtainable—*at a cost competitive with conventional mufflers.*

NO LONGER is ultimate muffling efficiency dependent upon trial-and-error locating of exhaust piping. With the Fluor Series "D," exhaust piping can be of *smaller* diameter, location of outside exhaust chamber *flexible* without affecting pressure drop or noise attenuation and pulsation reduction efficiency.



The Fluor dual-element principle permits sizing muffler and piping to space requirements without setting up hazards common to single-element mufflers.

All elements, including interconnecting piping, are engineered to a minimum in diameter.

Because muffling is spread throughout a Fluor Series "D" System, the outside muffling chamber can be set at any desired distance from the engine room wall.

AVAILABLE FROM STOCK—A Fluor Series "D" Muffler System to fit virtually any 2- or 4-cycle, 200 to 2400 HP diesel engine is available from stock. You need only submit engine room design and dimensions, make, model and RPM of engine and whether muffling system is to be air-cooled or non-air-cooled. Inquiries will be answered promptly.

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MANUFACTURERS of Mufflers, Pulsation Dampeners, Gas Cleaners, Cooling Towers and Fin-Fan Units.
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REFINING

Butane-Asphalt Refinery Is Slated for Hawaii

PACIFIC REFINERS, LTD., has signed a contract with Fish Engineering Corp., Houston, for the design, engineering, and construction of a complete butane-asphalt refinery to be built in Hawaii. Design work is now under way and it is contemplated that the refinery will be ready for operation in June. Materials and equipment will be fabricated on the mainland and shipped to the islands.

The refinery will be built in the harbor district of Honolulu and will process a mixture of crude oil blended with butane. The plant will produce finished products of butane, road oil, gas oil, road asphalt, and roofing asphalt and is designed for a normal throughput rate of 3,000 bbl. daily of charging stock.

The initial production of products on an annual basis will be 70,000 to 100,000 bbl. of butane, approximately 50,000 tons of asphalt, 500,000 bbl. of gas oil for gas-plant fuel, and other products contained in the crude supply, consisting of naphtha and diesel oil.

At present no refinery is operating in the Hawaiian Islands, and this is the first of such plants to be constructed. Installation will make it possible to transport to the islands as a bulk shipment the previously mentioned products which have formerly been transported from the mainland as packaged items. The charging stock will be transported from the mainland to the island in standard type oil tankers.

Purpose of the plant is to furnish a better type of fuel for the manufactured-gas plant serving the City of Honolulu, according to the company. The new-type fuel to be produced for the gas-plant operations will be a refined gas oil which will materially improve the efficiency and operation of the gas system, eliminating or minimizing considerable difficulties presently being realized from using heavy residual oil for gas-plant fuel which results in gum, tar, and sulfur deposits in the gas-distribution system. The new fuel will improve the quality of gas produced, and the transportation of butane to the islands as a bulk shipment will make it possible to distribute this fuel to all outlying areas not now being served by the gas-distribution system of Honolulu Gas Co. Various products produced by the refinery will be transported to all the islands of the archipelago by barge.

Pacific Refiners, Ltd., is an affiliate of Honolulu Gas Co., Ltd.

Production of Aviation Gasoline Shows Increase

Production of aviation gasoline during the first 10 months of 1948 totaled 39,019,000 bbl., an increase of

NELSON REFINERY-CONSTRUCTION INDEX

Appears in the first issue of each month.
Explanation—Cost-imating No. 61, December 15, 1949, pages 91, 92.
Compiled by W. L. Nelson—Refinery Consultant—Tulsa.
Indexes of Individual Items—January, April, July, and October.

INDEX (1946 = 100)

	1947	1948	Sept. 1949
Centrifugal pumps	109.0	120.0	119.0
Reciprocating pumps	130.1	143.1	146.6
Compressors	114.0	128.0	117.0
Engines	109.0	120.0	110.0
Motors	*122.0	*135.0	*130.0
Transformers	*122.0	*135.0	*130.0
Instruments	†113.0	†120.0	†123.0
Miscellaneous equipment average	*117.0	*128.7	*125.1
Materials component	123.0	140.5	143.0
Labor component	113.5	128.0	139.5
Refinery construction index	117.1	132.8	140.6

*Subject to revision. †Revised estimate.

McCORD
"CLEARSITE"
SIGHT
FEED
McCord "Clearsite" plastic sight feeds provide a new degree of visibility and clearness, supplying positive proof of oil delivery. Due to its design this sight feed may be used as an independent sight at point of lubrication. As an accessory it can be added to any lubrication system. Specify "Clearsite."
McCORD "SF" LIQUID SIGHT FEED LUBRICATORS
A highly developed lubricator, particularly adapted to cylinder and bearing lubrication. Features: Precision built, most flexible and positive oil delivery system known. Supplied in 1 to 24 feeds. Specify McCord "SF" Lubricator.
For Sale by National Supply Co.
McCORD CORPORATION
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LININGS FOR
BUBBLE TOWERS • SETTLERS • STILLS • SEPARATORS • TANKS • AND VESSELS OF ALL TYPES • ENCASING AND FIREPROOFING STRUCTURAL STEEL AND PIPE • LINING WATER RESERVOIRS, DITCHES, DRAINS, AND CANALS • REPAIRING DISINTEGRATED CONCRETE AND OTHER MASONRY.
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District Branch Offices
R. N. Turner, Dist. Mgr., 228 No. La Salle St., Chicago 1, Ill. B. H. Mueller, Dist. Mgr., 6625 Delmar Blvd., University City (St. Louis), Mo. Philip D. Barnard, Dist. Mgr., 2036 Addison, Houston 5, Tex.
Branch Offices: Denver, Dallas, New Orleans

3.8 per cent over production during the same period in 1947, the U. S. Bureau of Mines reported.

At the same time demand for the fuel totaled 36,352,000 bbl., an increase of 5.8 per cent over the same period a year ago.

Domestic demand, however, was down but export demand showed a gain. Domestic demand amounted to 28,614,000 bbl., down 1.5 per cent over the corresponding 1948 period; and exports rose to 7,738,000 bbl., representing a gain of 46.1 per cent.

Demands for aviation fuel in October amounted to 3,135,000 bbl., a decline of 17.8 per cent from October 1948.

Stocks on hand on October 31 totaled 6,606,000 bbl., an increase of 382,000 bbl. at the end of the same period a year ago.

Construction Under Way on Propane Deasphalting Unit

Work is under way on a new propane deasphalting unit at British American Oil Co. Ltd.'s Clarkson, Ont., Canada, refinery.

When the $400,000 unit is completed it will be used for the production of high-quality lubricating oils in the bright-stock classification, the company announced.

Construction comprises a unit consisting of several pressure vessels, exchangers, condensers, and coolers; furnace, pumping, compressing, and control equipment, plus necessary piping.

The oils to be produced by the new equipment have not previously been among products of the British American Clarkson refinery. Operation of the propane deasphalting unit will be absorbed into the refinery's overall operation, according to the company.

Railroads Paying Higher Prices for Diesel Fuel

Contracts are being placed for January purchase of residual fuel oil and diesel oil by large railroads at prices substantially higher than those covering December business, it was indicated last week.

The general prevailing price on residual fuel-oil contracts was indicated at $1.20 by major railroads in the Southwest and other territories, according to reports. This compares with 90 cents during December for most contracts.

Meanwhile the Union Pacific Railroad warned Wyoming members of the United Mine Workers Union that a continued coal tieup would result in a switch to "100 per cent oil" for locomotive fuel.

A. E. Stoddard, railroad president, said that trains would maintain their schedules "on oil—if not on coal," and added that the road was operating on 50 per cent oil. He further stated that the 3-day week is insufficient to provide enough coal for the steam locomotives, proper maintenance for the mines, or a "sizable paycheck" for the miners.

Stoddard said increased costs have brought coal into oil's price bracket and "continued increases will force the Wyoming mines out of business."

Refined-Products Terminal Being Built at Lima, Ohio

A refined-products terminal which will receive gasoline and other refined petroleum products by pipe line direct from Ohio Oil Co.'s refinery at Robinson, Ill., is being built at Lima, Ohio.

Scheduled for completion in April, the new terminal will be the third built by the company in an expansion program which will greatly facilitate the distribution of products in the eastern part of its marketing area.

A similar terminal was put in operation at Indianapolis in 1945, and one at Muncie, Ind., will begin operations next month. They are served by a refined-products pipe line of the Buckeye Pipe Line Co., which is now being extended from Muncie to Lima.

for Speedy . . . Low-Cost Cleaning of Rigs, Diesels, Rotary Tables use

Oakite Steam-Detergent Cleaning

FOR speedy, low-cost cleaning of rotary tables, mud hogs, crown blocks, drilling rigs, drilling-rig Diesels, pipe lines, etc., try Oakite Steam-Detergent Cleaning. In fact try it on the toughest cleaning or paint-stripping job that comes along.

By combining the vigorous detergent action of a specialized Oakite material with mechanical force and heat, Oakite Steam-Detergent Cleaning literally blasts dirt away. Grease and muck disappear almost like magic. You'll particularly like the way you can clean hard-to-get-at recessed areas.

Oakite Booklet "How to Cut Cleaning Costs in the Petroleum Industry" contains details. Shows how to speed up and cut costs on other maintenance cleaning jobs with Oakite Steam-Detergent Cleaning. Copy mailed promptly on request. No obligation.

OAKITE PRODUCTS, INC., 44C Thames St., NEW YORK 6, N. Y.

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Which Garlock Gasket keeps joints tight regardless of temperature changes and vibration?

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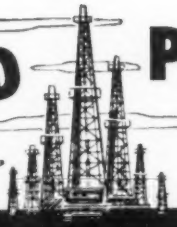

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Additional Drop Reported In Number of Active Rigs

Rotary rigs operating in the United States and western Canada during the week ended December 26 (latest report) totaled 2,200, a decrease of 52 as compared with the number reported during the preceding 7-day period. This was the second consecutive week in which a decrease was reported, which places the total 84 rigs below the peak number for the year, reached during the week ended December 12. The total was the lowest since week ended November 7 but still was 300 greater than the low of 1,900 rigs operating during the week ended September 26 before the latest upturn in drilling activity began. The greatest decline in activity was in the Illinois and eastern areas, where 17 fewer rigs were running than during the preceding week. Decreases were reported, however, in all areas.

ROTARY RIGS IN OPERATION*
United States and Western Canada)

Area—	Week ended 12-26-49	Change week ended 12-19-49	Change week ended 12-27-48
Gulf Coast	527	— 4	— 51
W. Tex.-N. M.	700	— 9	+ 106
Ark.-N. La.-E. Tex.	153	— 7	— 27
Oklahoma	259	— 2	+ 6
Kansas	134	— 2	— 1
Illinois-Eastern	124	—17	+ 2
Rocky Mountains	82	— 3	— 69
Pacific Coast	140	— 6	— 24
Total U. S.	2,119	—50	— 58
Western Canada	81	— 2	+ 11
Total	2,200	—52	— 47

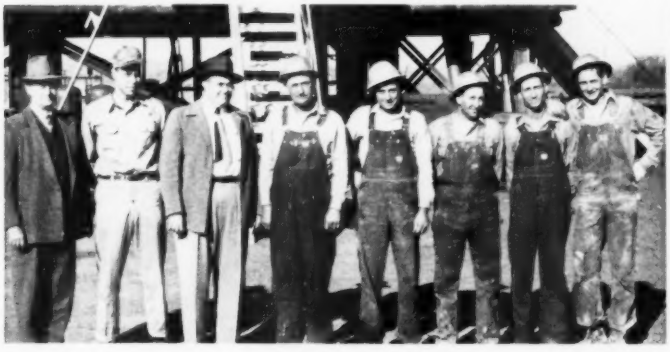
*Courtesy Hughes Tool Co.

Sam Trant, Dallas, has the contract for the second well which Atlantic Refining Co. is starting in the recently opened North Lansing gas-distillate field, Harrison County, East Texas. The new test, 1 Landers Unit, in the E. A. Merchant survey, is about 4,900 ft. north of Atlantic's discovery well, 1 Isom, completed 2 weeks ago in the Young section of the Glen Rose formation. It is contracted for 8,000 ft. to explore the Travis Peak, in which the discovery well also showed for production.

John Halko, Shawnee, Okla., has the contract for a Wilcox sand test to be drilled for Republic Natural Gas Co. in 28-17n-2e, 3 miles northwest of Goodnight, Lincoln County, Oklahoma. The test will be 1 Woolsey.

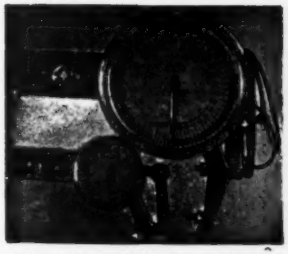
C. E. O'Neal Drilling Co., Evansville, Ind., has a rig running for Skelly Oil Co. in the Logansport field, DeSoto Parish, Louisiana, at the latter's 1 Fonville, C 10-12n-16e.

Commonwealth Drilling Co., Calgary, is preparing to move a rig into the Wabiskaw-Pelican Lakes region, North Central Alberta Province, Canada, to drill a second wildcat test in that area for the Barnsdall Oil Co.,



On location of a wildcat test, 1 Dunlap, which Woods Drilling Co., New Orleans, drilled for its own account near Perry, Noble County, Oklahoma. Left to right: W. E. Shorts and Gordon L. Smith, Wheland Co.; O. W. Shepard, Jones & Laughlin Supply Co., Oklahoma City; Jap Farris, driller; John Campbell, Andy Ableidinger, "Bud" Snyder, and Terry Johnson, drilling crew

LINE SCALES



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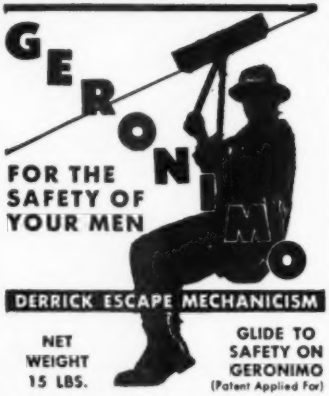

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Honolulu Oil Corp., and Seaboard Oil Corp. group. The proposed test is 1 Pelican Lake, located in LSD 4, 26-79-2w5.

Fleet Drilling Co., Ada, Okla., is moving in rig to drill another well for Van-Grisso Oil Co. and Glenn S. Norville in the North Alma pool, Stephens County, Oklahoma. Location for the well, 2 Pressgrove-Miller, is in 15-1s-4w.

M. G. Hanboro Drilling Co., Houston, has contracts for 2 wells to be drilled for T. W. Everett of Tyler, Tex., on the Hyde lease in the Como field, Hopkins County, East Texas. Both locations are in the Nacogdoches University survey.

Fleet Drilling Co., Ada, Okla., is contractor and joint operator with John C. Norris on a projected 5,300-ft. wildcat test being started in 28-3n-1w, about 6 miles southwest of Pauls Valley, in Garvin County, Oklahoma.

Crowe Drilling Co., Wichita, is the contractor and joint operator with Aladdin Petroleum Co. on a wildcat test, 1 Kramp, now drilling in 7-19-11, northwest of Great Bend, Barton County, Kansas.

Warren & Bradshaw Drilling Co., Tulsa, is starting a wildcat test in southeastern Payne County, Oklahoma, for Coronado Oil Co., an affiliated operating company. The location, in 26-18n-6e, is about 2 miles west of production in the Cushing field.

Redwing Drilling Co. has the contract for a wildcat test to be drilled for Tip Ray and associates at 1 Masonite, in 8-4n-11e, 2½ miles southeast of Roberts, in Jasper County, Mississippi. Contract calls for a test of Lower Cretaceous horizons with depth projected to about 6,300 ft.

Burnham & Browning, Shreveport, have been awarded contract for a 3,200-ft. test to be drilled for Harry W. Morris and Stanley V. Hume in the old Caddo-Pine Island field, Caddo Parish, Louisiana. The test, 1 Noel Estate, in 20-20n-15w, will try for production in the Glen Rose.

Grayhill Drilling Co., Oklahoma City, is starting a Hunton lime wildcat for Robert M. Jordon in the area between the Beardon and Papoose fields, in Okfuskee County, Oklahoma. The location, 1 Selfridge, is in 29-10n-9e.

Henderson Drilling Co. has contracted with O. F. Newsome and associates to drill 1 Baird, a wildcat located in the Robert Burton Survey, 5 miles southwest of Gilmer, Upshur County, East Texas.

Crow Drilling Co., Shreveport, has put a rig to work for David Crow and associates on a wildcat test in Bossier Parish, North Louisiana. Location is in 21-16n-11w. Hole is projected to 2,500 ft.

L. B. Jackson Drilling Co., Tulsa, has the contract for a wildcat test to be drilled in southeastern Payne County, Oklahoma, for R. E. Dirickson at 1 Gibbs, in 8-17n-6e. Rig is being moved in.

Warren & Bradshaw Drilling Co., Tulsa, has been awarded the contract for Carter Oil Co.'s latest projected well in the Katie pool, Garvin County, Oklahoma. Location for the well has been started on the Hamilton lease in 8-1n-1w.

Montgomery Drilling Co., El Dorado, Ark., has the contract for Stanolind Oil & Gas Co.'s latest well to be started in the Big Creek field, Richland Parish, Louisiana. It will be 24 Delta, located in 10-16n-72, and will be drilled as a Tuscaloosa sand test.

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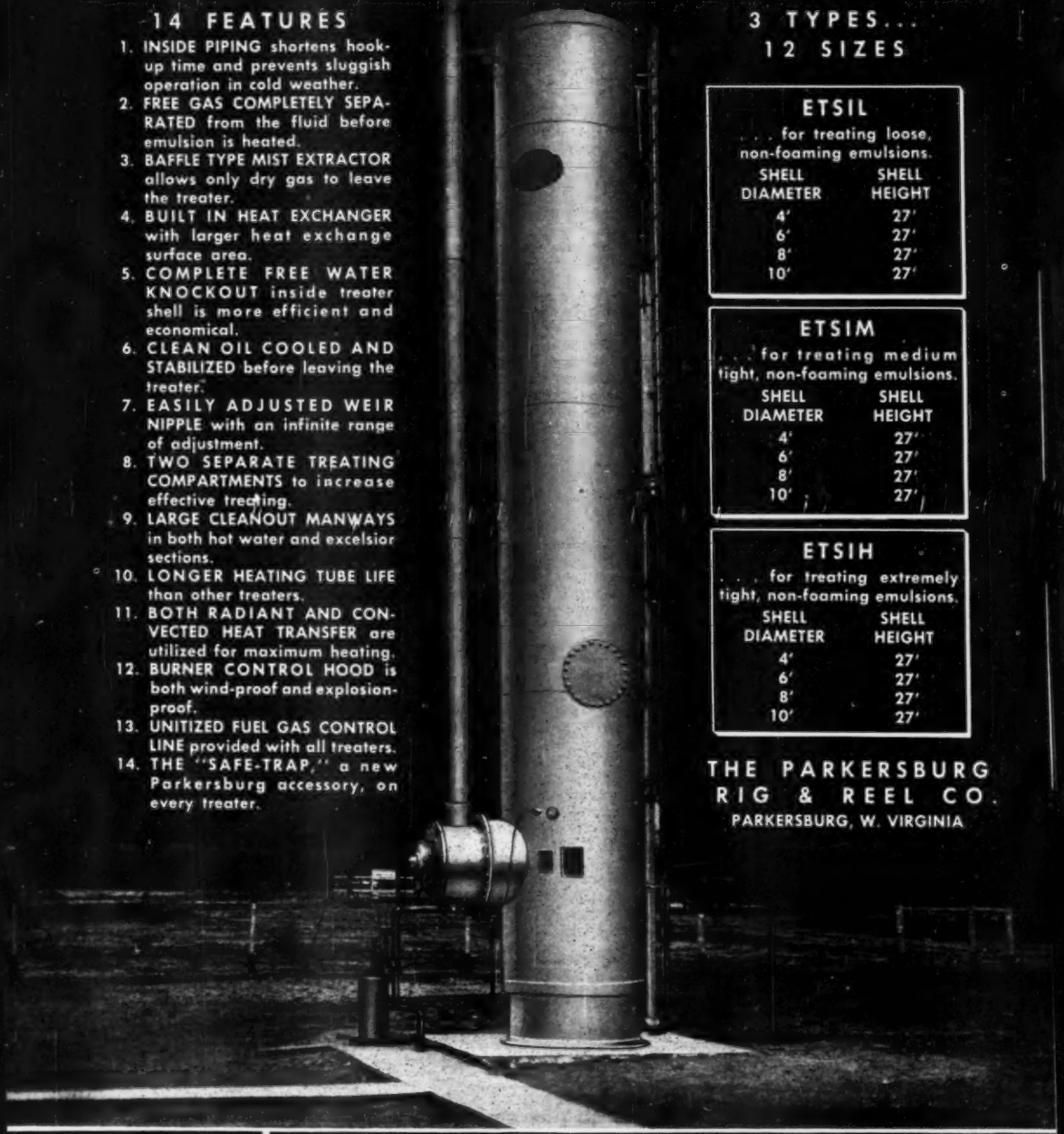

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NATURAL GAS

Line-Pressure Increase Is Granted Michigan-Wisconsin

Michigan-Wisconsin Pipe Line Co. has been authorized by Federal Power Commission to increase the compressor capacity of its new Texas-to-Michigan natural-gas pipe line from 21,600 to 29,600 hp.

FPC also allowed a temporary rate schedule for gas service through the pipe-line to remain in effect until January 31.

Michigan-Wisconsin was directed to file a new rate schedule on or before February 1. A previous order had permitted the temporary schedule to remain effective only until January 1.

The compressor-capacity increase will not increase the firm's annual sales capacity above the 56,575,000,000 cu. ft. previously authorized, nor will it involve service to new customers. The company said that the additional compressor capacity is needed because the delivery pressure at which it receives gas is lower than expected.

FPC authorized Michigan-Wisconsin to build the line last August, with a capacity of 155,000,000 cu. ft. of gas daily, to serve communities in Missouri, Iowa, Wisconsin, and Michigan.

Colorado Interstate Gas' Rehearing Request Denied

Colorado Interstate Gas Co.'s application for rehearing in the proceeding involving the Federal Power Commission order and decision of November 2 which directed changes in both volumes of the company's proposed natural-gas tariff, has been denied by the commission.

Volume 1 of the proposed tariff contains rate schedules for the sale of gas to a number of Colorado distributors, and Volume 2 covers sale of gas to Natural Gas Pipeline Co. of America.

FPC said Colorado Interstate's application for rehearing, as it relates to Volume 1, does not present or raise any question of law or of fact not previously considered and determined.

Order Issued in Virginia Gas-Service Proposals

Intermediate procedure has been ordered omitted by Federal Power Commission in two proceedings, one involving natural-gas service to Charlottesville, Va., and the other to Roanoke, Va.

Virginia Gas Transmission Corp., in the Charlottesville proceeding, is proposing to build and operate a metering and regulating station at a point on its 20-in. transmission line near Doylesville or Free Union, Va., and the firm would deliver the gas at that point to the City of Charlottesville. Proposed facilities would cost $9,000. The city is proposing to build 14.5 miles of 6-in. line from Virginia Gas' proposed regulating station to its existing distributing system at a cost of $225,000.

The Roanoke proceeding also involves Virginia Gas, which in this case is seeking authority to build and operate a metering and regulating station on its main line near Gala, Va., to make gas deliveries to Roanoke Pipe Line Co. The latter firm proposes to build a 30-mile line from the Gala point to Roanoke Gas Co.'s existing distribution facilities in Roanoke. Over-all cost would be approximately $586,000.

A delay in reaching a decision will result in inadequate service to the local customers, FPC found, among other things. The cities are now served with manufactured gas.

Hearings Under Way by FPC On El Paso-San Juan Line

Hearings were started this week in Washington, D. C., by Federal Power Commission on the proposal of El Paso Natural Gas Co. to build a 451-mile natural-gas pipe line from the San Juan basin to the Arizona-California line, to connect with Pacific Gas & Electric Co.'s system for gas service to the West Coast.

The application has been pending for several months. *(The Oil and Gas Journal, October 27, 1949, page 101.)* Hearings were held previously on the proposal by FPC and the commission ruled that El Paso failed to show a sufficient reserve supply of gas for the new line. The San Juan basin is located in New Mexico, Colorado, Utah and Arizona.

Last October El Paso asked for a new hearing, stating that it was ready to show it has an adequate gas reserve to supply the new line.

The proposed facilities would deliver 150,000,000 cu. ft. of gas daily to Pacific Gas & Electric Co., and 15,000,000 cu. ft. daily to several Arizona communities.

In Denver last week State Attorney General John W. Metzger said that Colorado will not object to shipment of natural gas from the San Juan basin to the San Francisco area if reserves of the field can be proven adequate.

Metzger made his statement in announcing that he would attend the hearings before FPC in Washington.

Hearing Set January 12 on Tennessee Gas' Proposal

A hearing will begin January 12 before Federal Power Commission in Washington, D. C., on application of Tennessee Gas Transmission Co., Houston, to construct a sales-meter station for sale of natural gas to the City of Morehead, Ky., on an interruptible basis.

The firm would build the meter station on its 26-in. gas-transmission line at a point about 2 miles from Morehead, at an estimated cost of $3,000.

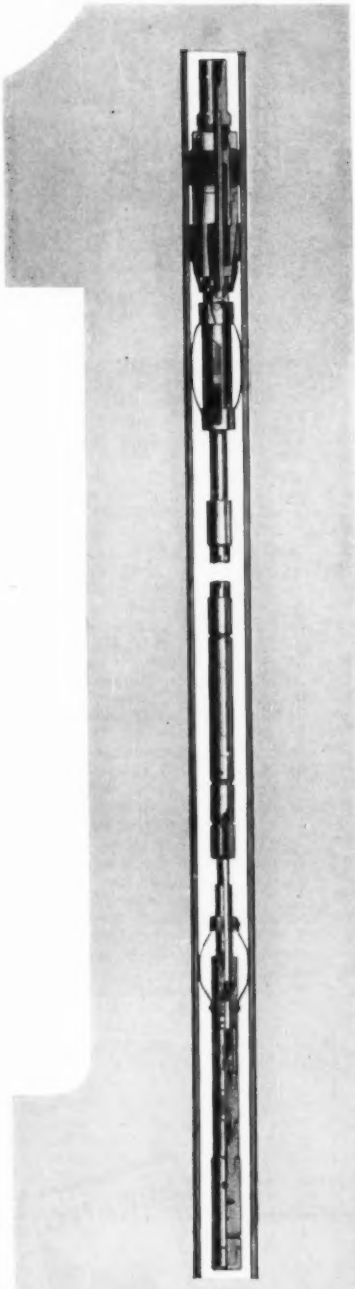
Tennessee Gas said it would sell quantities of natural gas required by the city over and above that which it receives from its present source of supply, but not in excess of 500,000 cu. ft. in any one day.

The City of Morehead said in a petition to intervene in the proceeding that it presently receives from the L. C. Young Co. gas produced from shallow wells in the city's area, but the petition alleged, however, that the Young company has been unable to meet demands in winter months, and said that a suit to cancel the contract between the city and the firm is now pending in the courts.

Motion to Dismiss Piedmont Proposal Denied by FPC

The motion of Commonwealth Natural Gas Corp. and Virginia Gas Transmission Corp., which included a request for dismissal of the application of Piedmont Natural Gas Corp. insofar as it relates to natural-gas markets in Virginia which Commonwealth is proposing to serve, has been denied by Federal Power Commission.

Commonwealth and Virginia Gas had asked, in the alternative, that the Piedmont application be severed from the consolidated proceedings involving the applications to serve the Virginia markets, and to dismiss the latter firm's intervention in the applications of Commonwealth and Virginia Gas. Commonwealth and Piedmont propose to transport and sell natural gas for resale in Richmond and Norfolk and Virginia Gas proposes to deliver and sell gas to Commonwealth. Tennessee Gas Transmission Co. is seeking authority to sell gas to United Fuel Gas Co. for resale to Virginia Gas, to enable the latter company to supply Commonwealth's requirements.



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Powder River Basin Activity

FOR years practical oil men have believed that where one oil field has been found, the general neighborhood is a good place to look for more fields. Geologists defined the phrase to mean that when an oil field had been found in a geological region, other areas in that region where conditions were similar were good places to look for oil.

Despite this, the southwest portion of the Powder River basin has been conspicuous for years because of the way Salt Creek field stood out on a map in such solitary grandeur. Discovered in 1906, this 400,000,000-bbl. giant got a little company when Big Muddy field was discovered in 1916. Big Muddy wasn't a giant, but a 35 to 40-million-barrel field isn't hard to take.

Then followed a long time gap until 1938, when Cole Creek was found in between Salt Creek and Big Muddy. It is small in area, but looks like about 15 to 20 million barrels.

Both geologically and geographically, these three fields lined up fairly well on a trend. But just about another 10 years went by before anything happened. Now it looks like they are coming with a rush.

Sussex pool, north of Salt Creek, begins to look up, especially in view of Delhi Corp. 1 Government, SE NW NE 35-42n-78w, a mile and a half south of the nearest production, and 1 mile south of the unit on which Continental Oil Co. developed Sussex pool.

The Steelco Drilling Co. discovery well, not far from the old Big Muddy field, and almost at the edge of the town of Glenrock, on completion flowed at rates reported from 35 to 70 bbl. per hour through chokes, so that looks like a fairly important field found.

Then we have the Amerada Petroleum Corp. discovery on its Sage Spring Unit in between Cole Creek on the south and Salt Creek on the north. Amerada's 4 Unit has just made a drill-stem test indicating an extension of production there of 2½ miles. On drill-stem test, open 2 hours, from 7,488-7,524 ft. (total depth), through 9/16-in. bottom-hole choke, it had gas to the surface in 8 minutes. When pulled, the recovery was 4,600 ft. of 36.7°-gravity oil, plus 1,000 ft. of oil-cut mud.

With results like these, it can be said with reasonable assurance that 1950 will see a lot of wildcat drilling both north and south of Salt Creek, and most geologists will consider it a reasonable bet that eventually there will be a lot of oil fields lining up on trend.

In the meantime the development of substantial production in the stratigraph traps along the east side of the Powder River basin keeps plugging along, with enough finds and enough oil produced to make it profitable. This is a tough area for the geologist, because with the best tools and information available, sand pinchouts favorable for oil accumulations are expensive to find.

Then there are the geologists who are playing the south rim of the Powder River basin, and trying to line up and find more oil fields on trend between Big Muddy on the west and Lance Creek on the east. The Lightning Creek discovery this year was encouraging, but it was so close to Lance Creek that it didn't leave any intervening trend to be called proven. It may well be that 1950 will turn out to be a big year for the Powder River basin.

In one way it seems odd that this play should have been delayed so long. As Rocky Mountain geology goes, the geology around the southern rim of the Powder River basin and its extension northward on both the west and east edges isn't particularly complicated. Most of the operating companies with long experience in the Rocky Mountain area have had regional maps for many years that look quite similar to the U.S.G.S. Preliminary Map. No. 33, Oil and Gas Investigations, "Structure Contour Map of the Powder River Basin, Wyoming and Montana," by Pierce and Girard in 1945.

One answer of course is that things aren't always as simple as they seem, when it comes to pinning down an oil field. A lot of dry holes have been drilled around the Powder River rim since Salt Creek was discovered. The first applications of geophysics to the solution of the geological problems didn't seem to bring the answers very quickly, either. Some geologists think that better geophysical techniques and particularly better interpretation in terms of geological conditions are responsible for the improved results.

Charles J. Deegan.

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

ROCKY MOUNTAIN AREA.—Leasing and drilling campaigns are increasing for the Denver Basin of western Nebraska and northeastern Colorado. The Ohio Oil Co. is coring ahead after recovering water in Lakota at its Huntsman wildcat, Cheyenne County, Nebraska, where gas was discovered in Dakota sands. Newell et al., are testing their Dawes County, Nebraska, wildcat, where shows were logged in Dakota.

WEST CENTRAL TEXAS.—Five miles west of Wingate, northwest Runnels County, Powell and Murray 1 Odom prepared to take potential after making an estimated flow of 75-100 bbl. of oil an hour on a drill-stem test at 5,308-50 ft. Gas surfaced in 2 minutes and oil in 4½ minutes. Flowing pressure was 1,350 psi. The pay section has been identified as the Strawn reef. Eight other wildcats and extension tests were active in the north half of the county.

WEST TEXAS.—M. E. Davis and others 1-A Schattell, 90-2-H&TC, Ellenburger prospect 5 miles southeast of North Snyder field, swabbed 5 bbl. of oil an hour for 8 hours following acid treatment through perforations at 7,736-65 ft., and was shut in.

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TEXAS GULF COAST

Location Staked for Brazoria Wildcat

HOUSTON.—Location has been staked by Cecil Hagen for a 5,800-ft. wildcat in Brazoria County, southeast of South Thompson field of Fort Bend County. Test is 1 Joe Bingham Estate on a 143.2-acre lease in Francis Bingham Survey, Abstract 43, 8 miles southwest of Arcola. The well is 2,000 ft. southeast of Hickory Petroleum Co. 1 Bingham, a dry hole.

Gas and condensate are being tested in the Fort Bend County wildcat test of Jack W. Frazier and Humble Oil & Refining Co. Well is the 1 Will Hartlange on a 243.9-acre lease, John Frederick Survey, Abstract 172, 5½ miles northeast of Richmond townsite and 1½ miles south of Clodine field. Hole is bottomed at 8,005 ft. and 5-in. casing set at 7,420 ft. with perforations from 7,391-93 ft.

Randon Production Co. has staked location for an 8,500-ft. wildcat 6 miles northeast of Dayton townsite, Liberty County. It is the 1 W. C. Atkinson on a 468-acre lease in Reason Green Survey, Abstract 43.

Skelly Oil Co. is scheduled to start a test soon in Liberty County, also. It is 1 R. H. Bosworth, a 9,000-ft. test located on a 621.67-acre site in Beasley Pruitt Survey, 3 miles northwest of Dayton townsite and 1 mile northeast of the Martha area.

Sparta Oil Co. is digging in hard shale below 7,100 ft. in its Harris County wildcat 3 miles northeast of Katy. Contract depth is 7,750 ft. and the wildcat is located on a 640-acre lease in H&TC Railway Co. Survey, Section 62, Block 2.

TEXAS GULF COAST (DISTRICTS 2 AND 3) SUCCESSFUL WILDCAT

Live Oak County: Western Natural Gas Co. 1 Block 77 Unit, Simmons Subd., R. W. Fant Sur 18, 5½ miles south of Simmons City on 640-acre lease, TD 7,063 ft., perf. 40 shots 6,852-60 ft. in Wilcox, made 2,219 M.c.f. daily of gas and 72 bbl. condensate on potential test, GOR 44,709 to 1, tubing pressure 2,260 psi.

TEXAS GULF COAST (DISTRICTS 1 AND 4) WILDCAT FAILURES

Brazoria County: Freeport Sulphur Co. A-3 3 Freeport Sulphur Co., Bryan Mound area, S. F. Austin Sur. A-35, 3½ miles southwest of Freeport, temporarily abandoned, TD 3,650 ft.

Gulf Oil Corp. 1 J. H. Caldwell et al, Peach Point area, S. F. Austin Sur., Lge. A-20, dry, TD 11,338 ft.

Hickory Petroleum Co. 1 Joe Bingham, 44-acre lease, Francis Bingham Sur. 13, A-43, 8 miles southwest of Areola, dry, TD 8,331 ft.

Harold Link 2 Belle Wisdom, 553-acre lease, A. Darst Lge. A-61, 2 miles north of Damon, dry, TD 7,343 ft.

Harris County: S. A. Brewster and W. O. Bartle 1 I. M. Schaper, Williams Sur. A-834, 1½ miles north of Alief field, dry, TD 8,069 ft.

Jackson County: Delhi Oil Corp. 1 A. V. Crocker, 160-acre lease, Section 17, C. W. Hahl Subd., H. Burns Ranches, 1½ miles of La Salle field, dry, TD 7,015 ft.

Karnes County: Kirkwood & Morgan, Inc., 2 Herman O. Kellner, John W. Clifton Sur., 7 miles northeast of Fashin, dry, TD 3,951 ft.

Matagorda County: Perry R. Bass et al 1 Armour-Duncan, S. A. Larche Sur. A-348, 1½ miles south of Magnet, dry, TD 8,197 ft.

Ohio Oil Co.-Melben Oil Co. 1 State of Texas 31794, Tract 403, Gulf of Mexico, dry, TD 8,454 ft.

H. A. Porter et al 1 Nora A. Freeman, Van Dorn & Balis Sur. A-96, 2 miles west of Sargent, dry, TD 6,995 ft.

Refugio County: Clymore Petroleum Corp. 1 Sullivan, 131-acre lease, J. Coughlin Sur. A-16, 7 miles northwest of Refugio, dry, TD 6,502 ft.

Wharton County: Hassie Hunt Trust 1 R. J. Prasifka, 90-acre lease, Block 19, Missouri-Lincoln Subd., Joseph Clements Sur. A-82, dry, TD 6,250 ft.

L. M. Josey, Michael T. Halbouty and Crown Central Petroleum Corp. 2 J. B. Gary est., S. F. Austin 3 1/6 Lge. Sur., dry, TD 6,471 ft.

EASTERN TEXAS

Official Potential Established For Harrison County Strike

DALLAS.—Railroad Commission potential was made last week at Atlantic Refining Co. 1 M. P. Isom, gas-distillate discovery of North Lansing field 7½ miles northwest of Hallsville in Harrison County, and location was made for a 4,900-ft. north offset confirmation test.

While the 1 Isom had shown for commercial production from both the Rodessa and Travis Peak zones, the potential was made only on the Young section of the Rodessa, and further work on the Travis Peak was slated for a later date.

Perforations were made at 6,734-40, 6,762-68 and 6,778-98 ft., from which it flowed 16,000,000 cu. ft. of gas, plus 416 bbl. of 52.6°-gravity distillate in 24 hours. Shut-in casing pressure was 2,860 psi.

On an elevation of 267 ft., the well had the following sample tops: Navarro chalk 1,937 ft., Pecan 2,203-2,737 ft., Austin 3,404 ft., Comanche 3,454 ft., Goodland 4,366 ft., Paluxy 4,485 ft., upper Glen Rose 4,845 ft., probable base of the Massive anhydrite 6,350-60 ft., and top of Travis Peak 7,398 ft.

In Wood County, completion attempt was to be made at Hollandsworth Oil Co. 1 G. R. Schenewerk, prospective discovery or extension 1½ miles south of Pine Mills field, William Fisher Survey. Five-inch casing was set on bottom at 5,627 ft., and perforations were to be made in the Woodbine section from 5,593-98 ft. Electric log on the well indicated other sands with good kick at 5,365-75, 5,403-10, and 5,423-35 ft.

EAST TEXAS (DISTRICTS 5, 6, AND 6-P) SUCCESSFUL WILDCAT

Harrison County, North Lansing field discovery: Atlantic Refining Co. 1 M. P. Isom, E. A. Merchant Sur., A-430, 7½ mi. NW Hallsville, TD 7,994 ft., elev. 267 ft., official completion from Young zone of the Rodessa, perforated at 6,734-93, 7,834-40 ft., with packer at 7,334 ft., flowed 16,000,000 cu. ft. of gas a day, plus 26 bbl. of 53°-gravity distillate per 1,000,000 cu. ft. of gas, open flow, may be completed from Travis Peak later.

EAST TEXAS (DISTRICTS 5, 6, AND 6-P) WILDCAT FAILURES

Denton County: Will Flew Oil Corp. 1 Banker's Life Insurance Co., A. H. Lynde Sur., A-731, 2 mi. W Sanger, dry, TD 1,950 ft.

Wm. H. Rouzer 1 Luther Odom, J. B. P. January Sur., A-658, 3½ mi. NW Sanger, dry, TD 1,772 ft.

J. W. Baldwin 1 Bessie B. Forester, J. B. Boroux Sur., A-45, 2½ mi. W Bolivar, dry, TD 1,763 ft., elev. 712 ft.

D. H. Bolin and Wilcox Oil Co. 1 J. Jackson, H. Estis Sur., A-389, 3 mi. W Pilot Point, dry, TD 1,521 ft., top lime 1,400 ft.

Theck & Cross Drilling Co., Inc., 1 Maurice B. Justice, J. Ayers Sur., A-2, 4½ mi. S Sanger, dry, TD 2,400 ft., elev. 674 ft.

Hopkins County: B. G. Byars 1 D. B. White, L. A. Matthews Sur., 10 mi. S Sulphur Springs, dry, TD 6,441 ft., in Paluxy, elev. 524 ft., Georgetown 5,232 ft.

Watson W. Wise 1 O. P. Wallace, Winnie Jewell Sur., A-503, 1½ mi. E Reilly Springs, dry, TD 4,390 ft., elev. 446 ft., sub-Clarksville 3,976 ft., by samples.

Red River County: W. B. Hinton and J. B. Stephens 1 Archie Pryer, MEP&P Sur., 1½ mi. E Bagwell, dry, TD 3,176 ft., elev. 452 ft., Paleozoic 3,169 ft., DST of Rodessa at 2,550 ft. failed.

Shelby County: Wm. Hamm, Jr., 1 J. H. & Poy Stewart, J. C. Stallings Sur., 8 mi. SW Center, dry, TD 6,515 ft., elev. 454 ft., Nacatoch 2,594 ft., Pecan Gap 2,904 ft., Blossom 3,272 ft., Georgetown 3,845 ft., Paluxy 4,375 ft., Glen Rose 4,622 ft., Massive anhydrite 6,059-6,254 ft., Kilpatrick 6,287 ft., Gloyd 6,420 ft.

Smith County: A. O. Phillips 1 B. G. Staples, J. J. Knowles Sur., A-537, 2 mi. SW Lindale, dry, TD 7,771 ft., elev. 454 ft., Georgetown 6,215-20 ft., Goodland 7,416 ft., Paluxy 7,416 ft., by samples.

KANSAS

Stafford County Wildcat To Test Simpson Showing

OPENING of a new Simpson sand pool, located in southern Stafford County, is in prospect at L. B. Sableford 1 Harter, NE NE SW 30-24-13, where casing has been run to test showings encountered in this pay, topped at 4,164 ft. A drill-stem test, taking in an interval at 4,172-4,202 ft., resulted in a recovery of 180 ft. of clean oil and 120 ft. of oil-cut mud. Before running casing hole was drilled to the Arbuckle, logged at 4,205-50 ft., but the latter formation was dry. Nearest other production is in the St. Johns pool, about 2½ miles to the northeast.

In Ellis County, Petroleum, Inc., is proving a new Lansing lime pool at its 1 Froelich, SE SE SW 22-12-16, which swabbed at the rate of 3½ bbl. of oil per hour while cleaning out after perforating casing at 3,278-84 ft. Previous tests, with casing perforated at 3,438-44 ft. and 3,447-53 ft., resulted only in small shows. Lansing was topped at 3,199 ft. (—1,211 ft.). Hole had been drilled to a total depth of 3,495 ft. in Arbuckle lime, topped at 3,467 ft., and in which casing was cemented at 3,468 ft. Arbuckle proved unproductive, and hole now is plugged back to 3,320 ft. This discovery is a mile northwest of the Northeast Emmeram pool and about 2 miles southwest of the Blue Hill pool.

Another prospective new pool is in the making in northern Stafford County, where Petroleum, Inc., is testing promising showings encountered in Arbuckle lime at its 1 Rothgarn, NE SW SE 14-21-13, 1¾ miles east of the Grow pool. Arbuckle was topped at 3,584 ft. and drilled to 3,597 ft. Casing was run to 3,590 ft. A drill-stem test of the pay gave a recovery of 30 ft. of oil-cut mud.

About 2 miles to the northeast in the SE SE NW 1-21-13, about a mile east of the Prairie Home pool, Derby Oil Co. and associates 1 Gunn also found good oil showing in the Arbuckle, topped at 3,497 ft. (—1,635 ft.) and have run casing to the top for testing. Rotary hole was drilled to 3,498 ft.

KANSAS SUCCESSFUL WILDCATS

Ellis County: Peel & Hardman 1 Haas, C/NL NE NE 2-15s-19w, pumped 182 bbl. of oil per day from Arbuckle at 3,697-3,703 ft., TD.

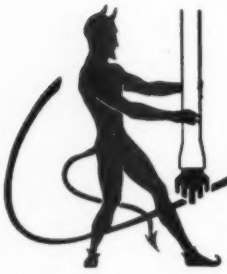
Russell County: Crown Drilling Co. 1 Foster, SE SE NE 29-12s-14w, pumped 12 bbl. of oil per day from Lansing at 2,841-53 ft., TD 2,854 ft.

KANSAS WILDCAT FAILURES

Brown County: N. A. P. 1 Rottinghaus, NW SW NW 10-4s-16e, dry, TD 3,310 ft., Howard 755 ft., Topeka 830 ft., Lansing 1,074 ft., Kansas City 1,390 ft., Mississippian 2,330 ft., Kinderhook 3,490 ft., Hunton 2,721 ft., Maquoketa 3,230 ft., Viola 3,293 ft.

Ellis County: Aylward et al 1 Moore, SE SE SW 5-15s-19w, dry, TD 3,741 ft., anhydrite 1,280 ft., Heebner 3,308 ft., Dodge 3,327 ft., Lansing 3,353 ft., Kansas City 3,605 ft., conglomerate 3,639 ft., Arbuckle 3,689 ft.

Marion County: A. J. Stormfeltz 1 Hoff-



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man, C/SL SE SW 34-19s-5e, dry, TD 2,377 ft., Viola 2,355 ft.

Rice County: Graham & Stark 1 Mathes, NE SE SW 4-22s-8w, dry, TD 3,792 ft., Lansing 2,995 ft., Mississippian 3,370 ft., Kinderhook 3,428 ft., Viola 3,656 ft., Simpson shale 3,694 ft., dolomite 3,698 ft., Simpson sand 3,718 ft., Arbuckle 3,767 ft.

Saline County: L. B. Jackson 1 Threlkeld, SW SW SE 27-16s-1w, dry, TD 2,732 ft., Mississippian 2,680 ft.

Sedgwick County: Carlock et al 1 Hyatt, NW NW NE 30-25s-1e, dry, TD 3,000 ft.

Stafford County: Anschutz et al 1 Alphine, SE SE NW 12-21s-13w, dry, TD 3,617 ft.

ROCKY MOUNTAIN

Denver Basin Gets Another Location

DENVER.—Another location in the northeastern area of the Denver basin has been announced, indicating that an increased exploratory drilling campaign will be under way in this area during the coming year. Valentine Oil Co., of Chadron, Neb., is drilling below 300 ft. on a Dakota test at 1 Murphy, SW SW SW 5-34n-46w, in the Adaton area, Sheridan County. This is one of several scheduled for this area between the towns of Chadron and Alliance, more than 50 miles north of Ohio Oil Co.'s Gurley pool and Huntsman wildcat, now being drilled. At Gurley, production is from the first and third Dakota sands, with a total of approximately 1,000 bbl. of 34°-gravity oil daily from six wells.

Six miles southwest of Gurley, Ohio Oil is coring below 5,075 ft. at 1 Cruise, NW SW SE 7-14n-49w, wildcat in the Huntsman area. This well, Ohio Oil's second wildcat in the western Nebraska area, has caused considerable interest after the operator recovered oil on tests of the first Dakota sand and sizable volumes of gas from the second and third benches of the Dakotas. Water was recovered on drill-stem tests in the Lakota, topped at 4,992 ft., and it is considered probable that the company will run casing through these sands and drill the well to granite, expected at around 8,000 ft.

Matt Newell, or Casper, and H. L. Hollingsworth, of Chadron, are now testing their 1 Neeland, C NE SE 30-30n-48w, wildcat in the Cottonwood area, Dawes County. The well is now at 2,960 ft., total depth, with casing cemented at 2,600 ft. Shows were logged in the Dakota sand but it is doubtful that the well is commercial at its present depth.

Increased leasing activity has resulted from the Ohio Huntsman gas discovery and the shows in the Newell et al well. Union Oil Co. of California has recently recorded leases covering 110,000 acres in Box Butte and Sheridan counties, and is expected to do seismic work in the area. Superior Oil Co. has leased extensively throughout the southwestern part of the state. Ohio Oil has continued leasing through Chase, Dundy, and Perkins counties, and recently has been leasing in Yuma and Phillips counties, Colorado. Carter Oil Co. has also entered the lease play, acquiring lands in Logan, Phillips, and Yuma counties, Colorado. Two wildcats of interest are being drilled in northern Colorado, and a discovery at either would start an extensive drilling campaign throughout the area. The wells are Carter 1 Blanchard, C SE NE 11-6n-55w, in the Fort Morgan area, Morgan County, which is now below 4,000 ft., and Carey-Bay-Plains-Republic Natural Gas Co. 1 Conklin, C NW SW 23-10n-51w, in the Iliff area, Logan County, which is below 3,800 ft.

COLORADO WILDCAT FAILURES

Asbury Creek, Mesa County: Amerada Petroleum Corp. 1 Unit, C SE NE 14-9s-101w; TD 4,223, PB 2,882, completed as a shut-in gas well; tested 2,000 M.c.f. gas per day; 5½-in. casing at 2,836; Dakota 2,717, first gas sand 2,836-67, second gas sand 2,915-33, Morrison 2,960, Entrada 3,504, Chinle 3,960, Granite Wash 4,110, pre-Cambrian granite 4,193 ft.

Hartzel anticline, Park County: McDannald Oil Co. 1 State, CN½ SE NW 20-12s-47w; TD 6,182; PB 5,212; abnd.; Niobrara 3,750, Timpas 3,950, Benton-Codell 4,010, Greenhorn 4,065, Dakota 4,380, Morrison 4,803, Fault-Benton 4,958, Dakota 5,163, Morrison 5,458, Fault-Dakota (?) 5,520, Morrison 5,575, Maroon 5,748 ft.

SUCCESSFUL NEBRASKA WILDCAT

Gurley area, Cheyenne County: Ohio Oil Co. 3 W. T. Knievel, SW SW SE 2-15n-49w; TD 4,554; pumped 65 bbl. oil per day 12 per cent water; Niobrara 3,628, Fort Hays 3,855, Codell 3,955, Greenhorn 4,131, first Dakota 4,369-4,416, second Dakota 4,428-61, third Dakota 3,490-4,554 ft.

APPALACHIAN FIELD

New Oriskany Location Staked in Wood County

PITTSBURGH.—A new Oriskany location has been staked in Steele District, Wood County, West Virginia—United Carbon Co. et al 1-1682 Mary Elizabeth Stuckey et al, elevation 960 ft. It is located on the Belleville Quadrangle 2.75 miles south of Lat. 39°, 05', 3.25 miles west of Long. 81°, 30'. Four other wells are drilling in this district: Godfrey L. Cabot, Inc., 1301 Thomas P. Beard at 5,230 ft. and 1313 G. P. Burkhart at 2,267 ft.; Columbian Carbon Co. 1159 Augusta Carson Radcliffe et al at 1,925 ft., and 1140 F. B. Allman et al at 1,487 ft.

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In this section, but in Tucker district, Wirt County, Godfrey L. Cabot, Inc., 1317 Thomas Hughes is drilling at 1,715 ft. In Grant district, Nicholas County, a good shallow-sand gas well was brought in by Columbian Carbon Co. 1-1137 H. H. Alderson, gaging 2,011,000 cu. ft., completed at a total depth of 1,432 ft.

Wharton Township, Fayette County, Pennsylvania, William E. Snee et al 3 Indian Creek Coal & Coke Co., elevation 2,615 ft., after running 7-in. casing and bailing the hole, resumed drilling operations and the depth is now 7,015 ft.; Georges Township, Orville Eberly et al 1 N. E. Murphy, elevation 2,560 ft., is drilling at 6,576 ft. Napier Township, Bedford County, South Penn et al-Snee & Eberly 1 Jesse B. Miller, elevation 1,666 ft., is drilling at 5,633 ft.

SOUTHWEST TEXAS

Wildcat Planned for Starr County

CORPUS CHRISTI—C. G. Glasscock and Pontiac Refining Co. are planning a wildcat south of production in the newly opened Buena Vista field of Starr County. The 3,000-ft. test is the 2 Rafael Canales, 460 ft. southeast of Southwestern Oil Development Co. 1 Rafael Canales, a shut-in gas well. The wildcat is 330 ft. from the southeast line of Lot 7, Share 2B, La Sacaloca Grant, 30 miles northwest of Rio Grande City.

Delhi Oil Corp. 3 Hagist, wildcat in McMullen County, gaged 11,000 M cf. of gas daily and 14 bbl. of distillate on an open-flow potential test. The test, which is in the Loma Alta field area, is bottomed at 6,920 ft.

In Duval County's new oil field, Jergins Oil Co. 1 E. J. Rogers pumped at the rate of 15 bbl. daily from perforations at 3,040-46 ft. It is the second test for the field which is close to the Jim Hogg County line.

H. J. Porter has staked location for a 5,100-ft. wildcat 11 miles north of San Diego in Duval County. It is the 1 Garcia on a 60-acre lease in Share V, San Diego de Arriba Survey, Abstract 212.

S. A. Brewster-W. O. Bartle and F. A. Gillespie & Sons have staked location for a wildcat 14 miles east of Laredo in Webb County. It is 1 O. W. Killam in GC&SF RR Survey 1808 on a 640-acre lease. Contracted depth is 9,000 ft.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) SUCCESSFUL WILDCATS

Duval County: Ammann-McNab et al 1 A. Weil Est., Elizondo Sur. 568, A-1838, 18 miles SW Freer, PT 30 BOPD 1/4-in. choke, GOR 700-1, 32.5° grav., perf. 3,790-91 ft., TD 3,860 ft.

Jim Wells County: The Texas Co. 1 E. M. Brownlee, Wm. Hope Davis Gardens Subd., SPRR Sur. 17, 1 mile southeast Alfred, TD 5,700 ft., perf. 60 shots 3,353-58 ft., PT 61 BOPD, GOR 328-1.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) WILDCAT FAILURES

Bell County: Gilchrist Oil Co. 1 L. D. Curb, E. Evitts Sur. A-287, 4 miles south of Killeen, dry, TD 2,025 ft.

Caldwell County: Killam & Hurd, Inc., 1 Fritz Anton, John Tyler Sur., 5 miles south of Lockhart, dry, TD 2,488 ft.

Dimmitt County: Holland Oil Co. et al 1 W. S. Meyers est., I&GNRR Sur. 687, A-449, dry, TD 3,004 ft.

Duval County: L. O. Kelsey & Bill Fallis 1 W. H. Sling, W. M. Morgan Sur. 118, A-1611, dry, TD 3,025 ft.

Smith-Story-Wood et al 1 M. Gonzales, San Francisco Grant, A-216, 23 miles south of San Diego, dry, TD 5,618 ft.

Webb County: O. W. Killam 1 J. G. Garcia Heirs, Sur. 2252, 2 miles east of Mirando, dry, TD 2,050 ft.

SOUTH LOUISIANA

Pure's Offshore Discovery Flows 198 Bbl.

NEW ORLEANS.—Pure Oil Co.'s offshore discovery off St. Mary Parish has flowed 198 bbl. of 37°-gravity oil daily through 13/64-in. choke on an official state completion test. The well is located in State Lease 832 and is completed in an oil sand at 9,620-28 ft. Tubing pressure was 425 psi, and gas-oil ratio was 737 to 1 on the state test.

In West Feliciana Parish, which has no oil production, Big Chief Drilling Co. and R. A. Campbell have added a dry hole to the parish record. The operators' 1 Waller et al, 10-1s-1w, was plugged and abandoned after cutting to a total depth of 8,753 ft.

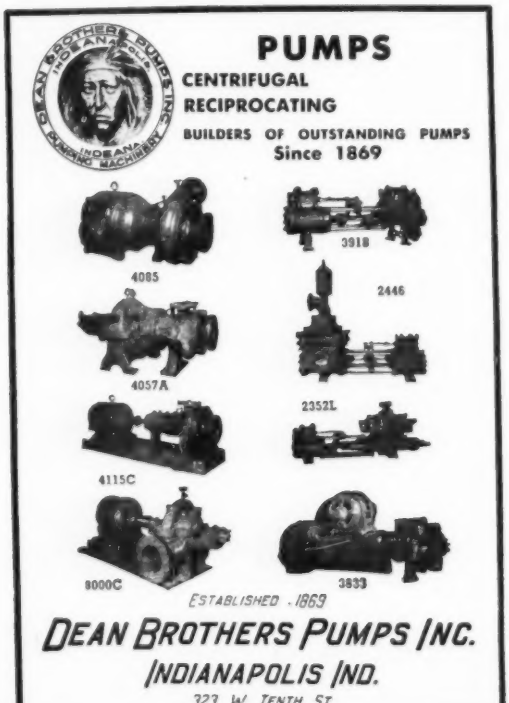
Sohio Oil Co. and Sinclair Oil Co. have spudded a joint test about 2½ miles southeast of Sunshine field, Iberville Parish. It is the 1 Cilano in 12-9s-13e. Casing has been set at 2,450 ft.

Magnolia Petroleum Co. is building another offshore platform in Block 111 off St. Mary Parish on state lease 687. This will be Magnolia's seventh offshore operation.

W. T. Burton is planning a 11,000-ft. wildcat 2½ miles southwest of Opelousas in St. Landry Parish. The test is 1 Milton Brown et al, SW 23-6s-3e.

SOUTH LOUISIANA WILDCAT FAILURE

Acadia Parish: Petersen Drilling Co. 1 P. J. Thevis, NW NW 22-8s-1e, temporarily abandoned, TD 11,085 ft.



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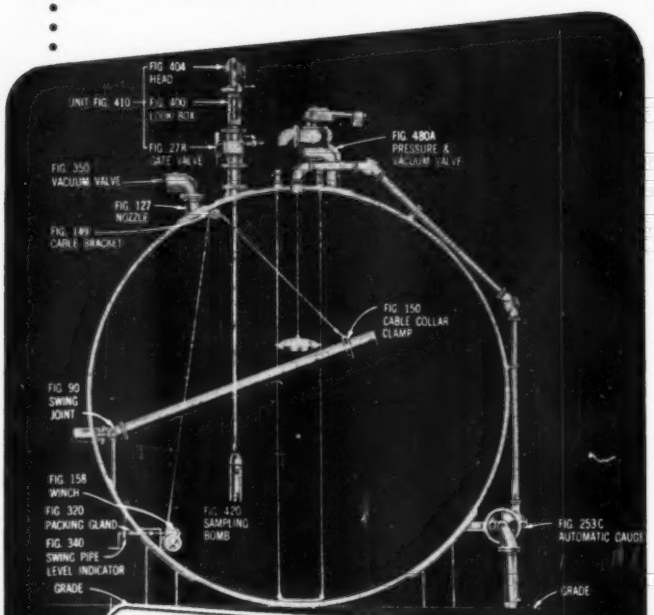

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CANADIAN FIELDS

Bay Petroleum Completes First Canadian Oiler

CALGARY.—Bay Petroleum Corp. has completed its first Canadian oil well and crew is now waiting for tankage facilities prior to running an initial potential test. The new oil well is located on a 40-acre Leduc tract acquired from the Alberta Government for a cash bonus payment of $51,150 plus a 15 per cent royalty bonus.

The well, Bay Petroleum Corp.-Leduc No. 1, LSD 7, 35-50-26w4, completed at 5,101 ft., 225 ft. above the indicated water level. D3 was encountered at 4,895 ft. or 2,801 ft. subsea and 7-in. string of casing was set at 5,095 ft. prior to drilling to total depth. Crew expects to have production set up completed shortly and then run potential test.

Four Canadian independents and an American oil firm have joined for an extension test a mile east of Imperial's Excelsior D2 zone Devonian oil discovery well in central Alberta. The group, Pacific Petroleums, Ltd., Sunray Oil Co., Atlantic Oil Co., Calvan Petroleums, Ltd., and Tower Petroleums, Ltd., will start moving equipment to well site during the first week of the new year.

The new venture, Pacific Excelsior No. 1, LSD 13, 2-56-24w4, is a mile east of the discovery and 1⅛ miles northeast of Rio Bravo's Excelsior driller. Commonwealth Drilling Co., contractor, will commence moving rig to location within the next few days.

Meanwhile, Rio Bravo-Carruthers No. 5-3, LSD 5, 3-56-24w4, ¼ mile south of the discovery well, is bottomed at 4,040 ft. and has set 7-in. casing at 4,007 ft. using 300 sacks. Crew is currently drilling out cement plug preliminary to heading on in search of D3 zone of Devonian. The well has cased through the D2 zone.

Oil success has been indicated at the second west Leduc venture of the Calgary independent team, General Petroleums, Ltd., and Superior Oils, Ltd. Their General Pete-Leduc No. 2 well, in LSD 16, 12-50-27w4, topped D2 zone of Devonian at 5,146 ft., found the upper portion tight, but broke into porosity around 5,190 ft. Coring was halted at 5,198 ft. and a drill-stem test was run. The test, of interval 5,174.5 to 5,198 ft., brought a gas blow with maximum rate of 490,000 cu. ft. daily. After 1 hour the pipe was pulled, and found to contain a 500-ft. column of clean crude oil and about 45 ft. of drilling mud. Hole has since been cored to 5,202 ft. and electrolog is now being run.

Eleven wells completed drilling in Alberta during the past week, five as successful oil wells, one gas well, and five failures. This week's new oil wells were at Leduc-Woodbend and Redwater; the gas well at Redwater, and the unsuccessful drillers were four wildcats and an extension effort failure near Whitemud.

At Redwater, Imperial Oil, Ltd., completed three more oil wells and a gas well to boost its total number of successful producers to 95 oil wells and 2 field-supply gas wells.

The Home Oil Co.-Anglo Canadian-C. & E. team started its twelfth Woodbend oil well on steady production and commenced drilling at another ¼ mile distant. Home Oil Co. completed another D2 zone oil well at Leduc and placed it on production.

The North Continental-Emjay Petroleum extension venture near Whitemud has been abandoned after failing to find commercial oil production. Sun Oil Co. abandoned its wildcat at Loyalist; Socony-Vacuum Exploration Co. was successful at its Vegreville exploratory test; Imperial abandoned its Jeffrey wildcat; and operations at Tandberg-Hansen's Tyrrel Lake wildcat have been suspended.

UNSUCCESSFUL WILDCATS THIS WEEK

Imperial-Jeffrey No. 1, LSD 6, 4-59-23w4, TD 4,470 ft.

Socony-Vegreville No. 1, LSD 14, 20-51-15w4, TD 3,880 ft.
North Continental-Emjay No. 3, LSD 4, 20-51-24w4, TD 5,293 ft.
Sun-Loyalist No. 1, LSD 1, 32-35-7w4, TD 5,761 ft.
Tandberg-Hansen No. 1, LSD 1, 16-6-17w4, TD 3,490 ft.

EASTERN CANADA

Pelee Island.—On Pelee Island, Lake Erie, south of the Essex County mainland in Ontario, an attempt will be made in 1950 to bring back into production a small shallow field opened in 1895. Drilling will be sponsored by Lake Erie Oils of Canada, Ltd., recently incorporated under Ontario charter with $3,000,000 capitalization. Officers are: president, Frank Whittal, Amherstburg, Ont.; vice president, George Carson, Akron, Ohio; secretary-treasurer and field supervisor, Ted I. Boomer. The company has purchased outright some 113 acres in the southeastern portion of the island.

Shallow drilling in 1895 brought in two small producers and one 400-bbl. flowing well, with four dry holes. Production came from the Onondaga or Corniferous limestone, the producing horizon of Petrolia and Oil Springs fields, and small quantities of crude were still being shipped in 1907. A deep test of the Trenton limestone was later drilled without success.

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Confirmation Slated For New Oil Pool

SHREVEPORT.—Plymouth Oil Co. has scheduled a confirmation test to its recent Rodessa oil discovery in the Greenwood gas area of Caddo Parish. The new well is designated the 1 Sanders, 660 ft. north and 1,320 ft. west of the southeast corner of the northeast quarter of Section 12-17s-16w. The discovery was completed for 30 bbl. of oil, plus 227,000 cu. ft. of gas daily from perforations at 4,779-4,803 ft., under tubing pressure of 725 psi.

Harry W. Morris and Stanley V. Hume announced location for a 3,200-ft. Glen Rose test in Caddo-Pine Island field of Caddo Parish. The new well is to be the 1 Noel estate, NE NW NE 20-20n-15w. Production will be sought from the Morringsport lime of the Glen Rose.

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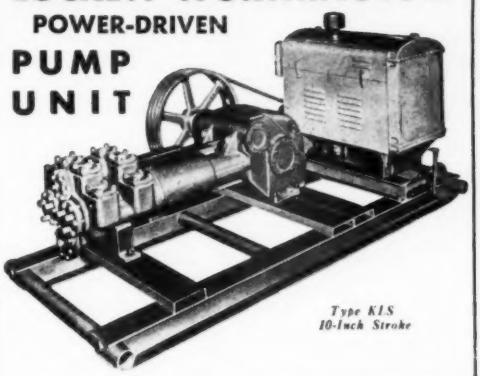

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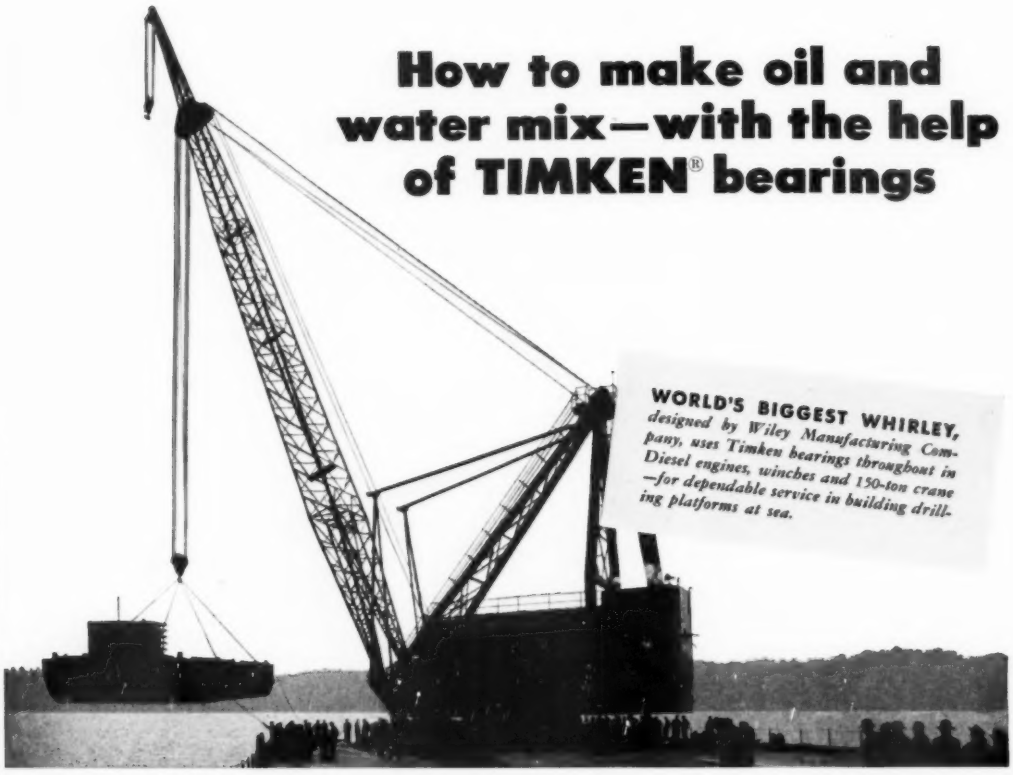

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Production possibilities from the Glen Rose were said to have been spurred by Blackwell Oil & Gas Co.'s 1 Muslow in 9-20n-15w, discovery of the new pay zone. In 16-20n-15w, the A. M. Rozeman 1 Mrs. J. Gibbs, was said to have found commercial production in the Morringsport, but channeling could not be overcome and the hole was plugged. The well was taken over by W. G. Blackwell and plugged back to 1,570 ft. where it completed as a gas well in the Annona chalk.

In the Haynesville field of Claiborne Parish Midstates Oil Co. 1-D H. R. Smith, 17-23n-8w, made an initial production of 618 bbl. of 49.6°-gravity oil in 24 hours. Total depth was 10,960 ft., and perforations were in the "B" zone of the Smackover lime.

PERMIAN BASIN

Kent County Discovery Continues Testing

MIDLAND.—Kent County's Canyon reef discovery well, J. A. Chapman Producing Co. 1 D. M. Cogdell, 716-97-H&TC, gaged 108 bbl. of oil in 10 hours, flowing through ¼-in. tubing choke, without acid. Flowing tubing pressure was 275 psi. The well was then washed with 500 gal. of acid and flowed 249.39 bbl. of 39.8°-gravity oil in 17 hours through 25/64-in. choke, under pressure of 150 psi. At last report, gaged through 20 64-in. choke, it flowed 82.5 bbl. of oil in 6 hours, under 100 psi. pressure. Testing was to continue.

Chapman made location for 2 D. M. Cogdell, located ½ mile east of the discovery, and 2,046 ft. from east and 467 ft. from south lines of Section 716.

Drilling & Exploration Co. 1 Wilson Connell, 19-5-H&GN, 2 miles southeast of Polar, was shut down for orders at 7,210 ft. Electrical surveys had been made. A drill-stem test in the Strawn at 7,131-46 ft., open 1½ hours, produced a light blow and recovered 30 ft. of gas-cut mud, 205 ft. of oil and gas-cut mud with salty taste, and 72 ft. of muddy salt water. Operators reported it had enough gas to kick fluid out of the drill pipe while the tool was being broken down.

George S. Anderson and W. R. Childers 1 A. C. Cargile, 25-5-H&GN, San Andres test 1 mile southeast of Polar, had delayed drilling plug on casing set at 2,345 ft. due to the holidays.

Gene Goff and others 1 Joe Rylander, 124-3-H&GN, wildcat 1 mile northeast of Snyder, logged light shows in lime at 7,065-68 ft., but did not test, and topped another lime (believed to be Strawn) at 7,147 ft., or minus 4,770 ft. A 2 hour and 40-minute drill-stem test from 7,175-97 ft. had gas in 5½ minutes which continued throughout the test. When the tool was closed, it began to head oil and continued as drill pipe was pulled, with no estimate made on the rate of fill-up, and no report on recovery. Top of the oil pay was said to be some 125 ft. high to top of the first Strawn oil zone in Sunray Oil Co. 1 Sentell, 5½ miles to the north.

Reports on Ted Weiner and others 1 Moore Creek Baptist Church, 8 miles west of Snyder and ⅞ mile north of the nearest producer, in 246-97-H&TC, indicated only light shows of oil on a drill-stem test of the reef from 6,834-6,910 ft., total depth. When the tool was opened it had only weak bubbles of air at the surface, but built up to a good blow which continued throughout the 1 hour and 50-minute period. Recovery was 90 ft. of gas-cut drilling mud, 90 ft. of slightly oil and gas-cut drilling mud and 30 ft. of oil and gas-cut drilling mud. Open flowing bottom-hole pressure built up to 150 psi., and shut-in pressure in 20 minutes was 70 psi. The wildcat had top of the reef at 6,830 ft., or minus 4,388 ft. Another report had top of reef lime at 4,391 ft. At last report operators were circulating while waiting on orders.

In southeast Scurry County, American Republics Corp. 1 Don C. Sivalls, 34-3-H&GN, recovered 15 ft. of lightly gas-cut mud on a 50-minute drill-stem test at 6,714-48 ft. Further details were not disclosed.

In eastern Scurry, M. E. Davis and others 1-A John J. Schattel, 90-2-H&TC, Ellenburger prospect 8 miles northwest of Baxter 1 Feldman, had drilled out cement on a squeeze job on perforations at 7,736-80 ft., which produced water, and prepared to perforate again for further tests.

WEST TEXAS (DISTRICTS 8 AND 7-C SUCCESSFUL WILDCAT

Runnels County: Sells Petroleum Co. 1 W. W. Mitchell, Burnett CSL Sur. 271, 2 mi. NW Norton, 11 mi. SW Winters, TD 4,428 ft., elev. 1,847 ft., Capps 4,354 ft., pay 4,381 ft., perforated 4,382-4,403 ft., flowed estimated 50 bbl. of oil a day on ½-in. choke, after casing flowed 15 bbl. of oil in 12 hr. following 3,000-gal. acid treatment, pumped 12.35 bbl. of 44.5°-gravity oil a day, plus 30 per cent salt water.

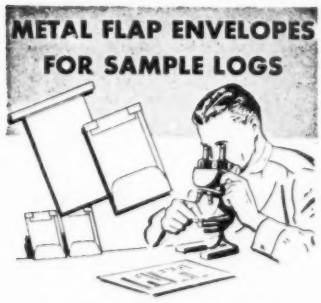
WEST TEXAS (DISTRICTS 8 AND 7-C) WILDCAT FAILURES

Hale County: Tobe Foster 1 G. A. Harrall, SW SW 7-O-D&SE, 6½ mi. N Hale Center, dry, TD 7,009 ft. in lower Permian, elev. 3,506 ft., no tests, no shows.

Runnels County: Sells Petroleum Co. 1 W. F. Wilde, Burnett CSL Sur. 271, 1½ mi. N Norton, dry, TD 4,017 ft., elev. 1,897 ft., Palo Pinto 3,981 ft., pumped 95 per cent salt water, 5 per cent oil at total depth.

SOUTHEASTERN NEW MEXICO

HOBBS.—Stanolind Oil & Gas Co. 1 D. E. House, 11-20s-38e, ½ mile south of its 1-U State, discovery well, had 5½-in. casing set at 4,438 ft., and was waiting on cement. Total depth was 4,440 ft. A drill-stem test from 4,263-4,440 ft., open 5 hours and 20 minutes, produced a strong blow of air immediately, had gas in 12 minutes and flowing oil in 1 hour. During the first hour it made 43 bbl. of foamy, oil-cut drilling fluid, and the next 3 hours flowed 66 bbl. of oil



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cut 40 per cent with drilling fluid. Operators said there was no formation water. Gas-oil ratio was 660 cu. ft. Bottom-hole flowing pressure was 1,050 psi., and 1,235 psi. after a 15-minute shut-in.

Stanolind's 1 Anna Foster, 23-19s-38e, wildcat 2 miles southeast of Hobbs, was drilling below 7,693 ft. in lime. A drill-stem test from 7,511-76 ft., open 2 hours, produced a strong blow, decreasing after 3 minutes, and recovered 30 ft. of gas-cut mud and 128 ft. of heavily oil and gas-cut mud. A second test at 7,385-7,487 ft., open 3 hours and 39 minutes, had gas in 2 hours and 43 minutes and recovered 1,350 ft. of oil and gas-cut mud, plus 1,350 ft. of oil-cut mud. Bottom-hole flowing pressure was 1,132 psi., increasing to 1,630 psi. when shut in 15 minutes.

Amerada Petroleum Corp. 1 Birdie C. Roach, 26-12s-33e, south extension try to Bagley field, and ½ mile south of Amerada's 1-BTB State, had total depth at 10,620 ft., plugged back to 9,432 ft. Following a 4,000-gal. acid treatment, it was swabbed in and flowed 156 bbl. of oil, plus 39 bbl. of water in 20 hours and 39 minutes; then in 11 hours it flowed 119 bbl. of oil and 42 bbl. of acid water, with gas-oil ratio of 634 cu. ft.

SOUTHEAST NEW MEXICO WILDCAT FAILURES

De Baca County: Abercrombie & Hawkins 1 J. L. Nappier "X," NE SW 22-5n-26e, dry, TD 7,149 ft., elev. 4,518 ft., Yeso 2,320 ft., Abo 3,991 ft., Pennsylvanian 5,040 ft., pre-Cambrian 7,148 ft.

Eddy County: Nunn & Sanders 2 Hightower, SE SE 17-17s-27e, 2 mi. W Empire field, dry, TD 501 ft.

TEXAS PANHANDLE (DISTRICT 10) WILDCAT FAILURE

Lipscomb County: Gulf Oil Corp. 1-E Porter "A," NW NE 413-43-H&TC, 3 mi. S, 3 mi. W Lipscomb, dry, TD 14,278 ft., elev. 2,78e ft.

ILLINOIS

Richland County Wildcat Indicates Good Oil Flow

MATTOON.—A discovery of more than average importance for the district appears to have been made by Alva C. Davis and Russell P. Johnson in their 1 Moore, a wildcat located in the NE NE SE 12-2n-10e, about 2 miles south of Calhoun, in Richland County. In a drill-stem test at 2,373-80 ft. in McClosky lime, the well flowed clean 38° oil at an estimated rate of 50 bbl. per hour. Gas showed at the surface within 4 minutes after the testing tool was opened. Indicated bottom-hole pressure was 1,250 psi. Bottom of the interval tested was still in the pay. Casing has been run to 3,265 ft. preparatory to completion. The location is about 2½ miles west of the Parkersburg Consolidated pool, nearest production.

C. H. Murdick and associates 1 Dixon, NW SW SW 27-7s-8e, a northward extension to the Omaha pool, in Gallatin County, has been completed on the pump making 150 bbl. per day from Biehl sand at 1,493-1,505 ft. Bottom of the hole is at 1,508 ft.

The recent Benoist sand discovery made by Ashland Oil & Refining Co. and associates at their 1 Kortage, NW SE NW 21-1n-13w, in the area 2 miles south of Lancaster in Wabash County, is being confirmed by a second well, the same operators' 2 Kortage, a location south of the discovery well. The latter also found good saturation in the same sand at 2,511-24 ft. and has run casing to 2,505 ft. for testing. The discovery well was completed early in December as a 94-bbl. pumper with pay at 2,513-24 ft. This is the first sand production in the general area. The spot is about 1½ miles northwest of the Friendsville pool and about ¾ mile northeast of a small isolated McClosky lime well.

ILLINOIS SUCCESSFUL WILDCAT

Gallatin County: C. H. Murdick et al 1 Dixon, NW SW SW 27-7s-8e, IP 150 bbl., Biehl sand 1,493-1,505 ft., TD 1,508 ft. (Extension Omaha pool).

ILLINOIS WILDCAT FAILURE

Christian County: Harry Prater 1 Wilkinson, SE SE NE 21-14n-3w, dry, TD 1,823 ft.

MISSISSIPPI

Humble Sets Casing In Adams County Test

JACKSON.—In Adams County, Humble Oil & Refining Co. has set casing, perforated and run tubing in its wildcat approximately ½ mile south of Natchez. The test is D-1 C. L. S. McKittrick et al, 50-7n-3w. Seven-inch casing was set at 10,422 ft. with 500 sacks of cement after the hole was drilled to a total depth of 10,548 ft. No information is available yet but tests are reported under way.

Pan-American Production Co. is preparing to run casing in its 1 J. E. Rushing et al, SW SW 20-5n-4e, Bude field, Franklin County. Test was drilled to a total depth of 11,015 ft. with one favorable core reported. At 10,980-11,007 ft. a recovery of 7 ft. of shale and hard silty sandstone with no show, and 18 ft. of good, soft oil sand was reported. The well is a direct east offset to a California Co. well which had 25 ft. of good Lower Tuscaloosa sand.

Carter Oil Co. 1 J. L. Wilson, 30-3n-1e, in the Pickens area, Yazoo County, is coring ahead below 11,838 ft. Six cores have been

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cut recently with only one show. Gas odor was detected in hard, tight limestone in the middle of 23 ft. of core from 11,735-85 ft.

MISSISSIPPI WILDCAT FAILURE

Wilkinson County: Don M. Reese 1 Crosby Lumber Co., 35-3n-1e, dry, TD 8,018 ft.

FLORIDA WILDCAT FAILURES

Dade County: Coastal Petroleum Co. 1 State-Grossman, 25-55s-37e, dry, TD 11,520 ft.

CALIFORNIA

Interesting Wildcat Continues Testing

LOS ANGELES—The C. W. Colgrove 54-18 Wright, test some 20 miles southwest of South Cuyama field has been the subject of considerable rumor for the past 3 weeks. Many of the reports have been extremely optimistic. The hole is bottomed in granite at 4,357 ft., with weathered granite topped at 4,085 ft. An open-hole test below tubing hung at 4,010 ft. swabbed muddy salt water. The well is now plugged at 4,025 ft., and further tests will be made. Reports are that as many as five sands up to 10 ft. thick were logged through the interval at 3,550-4,000 ft. Location is in Section 18-7n-23w.

Two miles southwest of 54-18 Wright, Cal-Nevada Oil Co. has graded location and made roads. This test is the 1 Behr, 22-7n-23w, and has been carried as a location for some time. Apparently results of the Colgrove try have had some bearing on going forward with drilling plans.

Richfield Oil has begun drilling on its 1 Round Springs unit, 4 miles northeast of the Colgrove test in 32-8n-23w. Drilling is going ahead beyond 2,000 ft.

Humble's 1 Newhall Land & Farming, 23-4n-17w, flowed 289 bbl. in 22 hours with 1,775,000 cu. ft. of gas. Gas sand was topped at 11,638 ft., and oil sand at 11,775 ft. The company is drilling ahead to test other possible formations. Original hole was bottomed at 11,839 ft.

Drilling & Production Co. has completed it 47-33 O.M.B. as an extension to Grapevine-Tejon field. The well came in flowing 127 bbl. of 20.9°-gravity oil per day. Location is 33-11n-19w.

In the Simi area of Ventura County, Northridge Oil Co. is drilling ahead at 1,500 ft. in its 1 Simco. This try in 31-3n-17w is the former 1 Simi which was standing as a location.

The deep test in the Castaic area, 10-4n-17w, the 1 Strawn, is now drilling beyond 2,000 ft. This is a joint test of Bolsa Chica Oil Corp. and Fred Manning.

At Arvin, Joseph F. Zottarelli 1 C. T. stopped drilling at 2,514 ft. and was put on test. Initial flow was 280 bbl. of oil per day gross, about 80 per cent cut. After rigging a pump, production fell to 12 bbl. of heavy oil 94 per cent water cut. Some time will be required to determine the possibilities of this well. Location is 1-31s-29e.

Lewis Welch has suspended operations in his San Marcos wildcat, Santa Barbara County. Depth stands at 6,235 ft. with $13^3/_8$-in. casing hung to 500 ft. The venture is the 1 Welch-Janeway, 11-6n-29w.

CALIFORNIA WILDCAT FAILURES

Fresno County, Burrell area: L. M. Lockhart 1-26 Burrell, 26-16s-18e, dry, TD 7,010 ft., elev. 215 ft.

Kern County, Cymric area: T. & M. Exploration Co. 1 Shearer, 26-29s-22e, dry, TD 7,722 ft., elev. 512 ft.

Kern Bluff area: National Steel & Shipbuilding Corp. 1 National-State, 30-29s-29e, dry, top Olcese 3,978 ft., base Olcese 4,930 ft., did not reach Vedder, TD 5,220 in Freeman silt, elev. 713 ft.

Paloma area: Humble Oil & Refining Co. 2 KCL 41-18, dry, L zone 10,434 ft., MM zone 11,048 ft., Symons sand 11,211 ft.,

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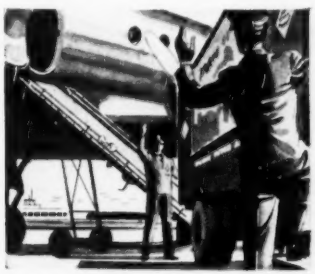

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Paloma sand 11,524 ft., TD 12,323 ft., elev. 290 ft.

Salt Creek-Cymric area: Standard Oil Co 76 Anderson, 19-29s-21e, dry, Phacoides 2,243 ft., TD 2,375 ft., elev. 1,013 ft.

Los Angeles County, Oak Canyon area: Douglas Oil Co. 1 Oak Canyon, 4-4n-17w, dry, TD 4,100 ft., elev. 1,500 ft.

OKLAHOMA

Production Tests Prove Lincoln County Discovery

PRODUCTION tests by Falcon-Seaboard Drilling Co. in its 1 Strader, a wildcat located south of Warrick in the SE NW SE 8-13n-3e, Lincoln County, have substantiated the discovery, indicated by previously reported drill-stem tests, of another new Bartlesville sand pool. In initial tests through various chokes, ranging in size from 12/64-in. to 16/64-in., the well flowed at an average rate of 32 bbl. per hour. On a 21-hour gage through 6/64-in. choke, it flowed 441 bbl., an average of 21 bbl. per hour. Bartlesville sand was topped at 4,685 ft. Production is from casing perforations at 4,687-92 ft. with bottom of the hole, where casing was cemented, at 4,695 ft. Nearest other production is in the Warrick pool, about 3 miles to the northeast.

In Okfuskee County, F. A. Gillespie & Sons 1 Meredith, NE NE NE 10-12n-9e, another new discovery well, is being put on the pump. Deepened 2 ft. from its former total depth of 3,700 ft. in Gilcrease sand, topped at 3,289 ft., where it had swabbed at the rate of 5 bbl. per hour while cleaning out, it kicked off and flowed at the rate of 100 bbl. per day. Agitation by pumping is expected to improve its production. The location is about 1½ miles north of the Northeast Castle pool.

What appears to be a possible connecting link between Sholem-Alechem and North Alma pools in Stephens County has been found by J. E. Crosbie, Inc., in its 1 Evans, SE SE SW 33-1n-4w. Deese sands showing oil were logged at 4,872-4,903 ft., 4,976-94 ft., 5,032-41 ft., and 5,068-77 ft. Drill-stem tests were made at 4,973-94 ft. and 5,032-77 ft. In the first, 28 ft. of oil and 32 ft. of oil and gas-cut mud was recovered. In the second, the recovery was 450 ft. of oil and 30 ft. of oil-cut mud. Casing has been run to the top of the lowest sand. The location is about 1¼ miles west of the north tip of Sholem-Alechem pool, and about a mile north of the North Alma pool, where production is from equivalent sands. Although several dry holes have been drilled around the north and west sides of the Sholem-Alechem pool, it is possible the pay zones may swing around these.

Located a half mile south and also west from nearest wells in the Doyle pool, in Stephens County, Van-Grisso Oil Co. and Glenn S. Norville 2 Burns has casing run to test promising oil showings encountered in a Pennsylvanian sand at 6,680-6,711 ft., a prospective new pay zone for the pool. In a drill-stem test of an interval at 6,684-6,706 ft. the well made a recovery of 180 ft. of oil and 130 ft. of oil-cut mud. Nearest well to the east produces from the Springer sand at 8,038-8,106 ft. Nearest well to the north produces from sands ranging in depth from 5,950-6,303 ft. The new well was drilled to the Springer sand at a total depth of 8,325 ft. but found that zone unproductive. Hole has been plugged back to the Pennsylvanian sand with casing cemented at 6,800 ft. An alloy section placed in the string opposite the sand will be opened for testing.

OKLAHOMA SUCCESSFUL WILDCATS

Carter County: McCasland 1 McClure, SE SW SE 15-5s-1e, flowed 48 bbl. of 41.5° gravity oil per day from sand at 3,840-70 ft., TD 6,340 ft.

Major County: Superior 1 Cottom, NE SW SW 33-22n-10w, flowed 124 bbl. of oil per day from Manning at 6,810-87 ft., TD 6,929 ft.

Seminole County: New pay in Searight—Siler et al 2-A Joe, SW SE SW 2-9n-6e, pumped 158 bbl. of oil per day from Senora sand at 2,808-18 ft., TD 2,823 ft.

OKLAHOMA WILDCAT FAILURES

Atoka County: Lee Drilling 1 Smith Butler, NE NE SE 30-3s-14e, dry, TD 2,400 ft.

Coal County: Rissler & Seltzer 1 Acker, NW SW NW 11-1n-8e, dry, TD 2,321 ft in Atoka shale.

Garvin County: Smiley & Little 1 Mantooth, NW NE SE 34-4n-1w, dry, TD 4,666 ft., base Pennsylvanian-second bromide 4,310 ft., third bromide 4,388 ft.

Okfuskee County: Texas 1 Tiger, SW SW NE 27-10n-10e, dry, TD 4,367 ft.

Burdell Oil et al 1 Whitney, NE NW SW 8-11n-10e, dry, TD 3,249 ft., Inola 2,295 ft., Bartlesville 2,314 ft., lime 2,565 ft., Booch 2,723 ft., upper Gilcrease 2,890 ft., lower Gilcrease 3,002 ft.

Okmulgee County: Pressley 1 Doneghy, NE SE SW 22-12n-13e, dry, TD 1,499 ft., Lansing 699 ft., sand 1,345 ft., shale 1,496 ft. (strat test).

Pittsburgh County: Grimes 1 Sarkeys, SE NW SW 14-7n-12e, dry, TD 4,374 ft., Wapanucka 3,980 ft., Union Valley 4,246 ft., Cromwell 4,361 ft.

Pottawatomie County: Blair et al 1 McKosato, NW NW NW 13-11n-5e, dry, TD 4,822 ft., Sylvan 4,590 ft., Viola 4,690 ft., Wilcox 4,767 ft., second Wilcox 4,813 ft.

Stephens County: Tharp 1 Farrell, NW NW SE 21-1s-7w, dry, TD 6,020 ft., base Pennsylvanian 2,510 ft., top Pontotoc 3,550 ft., Arbuckle 5,815 ft.

Shear 1 Mann, NE NW SE 28-2s-6w, dry, TD 2,786 ft. in Arbuckle detrital topped at 2,630 ft.

Tillman County: Nutting 1 Martin-Burba, NE NE NE 22-3s-15w, dry, TD 2,500 ft.

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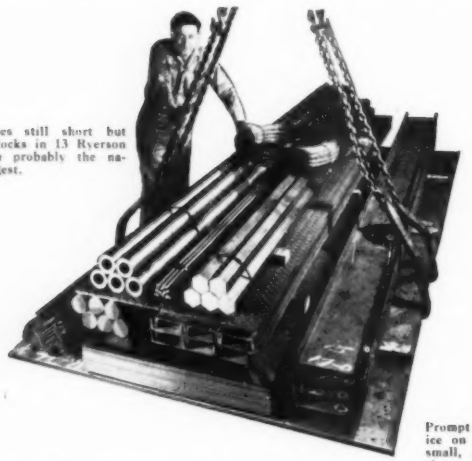

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N. CENTRAL TEXAS

Jack County May Get New Ellenburger Strike

WICHITA FALLS — Jack County had prospects of an Ellenburger discovery at Mid-Continent Petroleum Corp. 1 Roy Cherryhomes, J. Irvine Survey, 2 miles northwest of Cundiff. After treating with 500 gal. of acid at total depth of 6,649 ft., the well flowed 50 bbl. of oil the first hour and 20 bbl. of oil the second and third hours. It was shut in for an unreported period then reopened to flow 12 bbl. of oil an hour, and still cleaning itself of mud. Top on the Ellenburger had not been released.

Warren Oil Corp. 2 Gresham-Davis, semi-wildcat 6 miles northwest of Jacksboro in the John Little Survey, recovered 2,700 ft. of gas and 2 bbl. of gas-cut mud on a 2-hour drill-stem test from 5,650-5,800 ft. Top on the Ellenburger was 5,773 ft. Shut-in bottom-hole pressure was 500 psi in 20 minutes.

Hill & Hill 1 S. H. Pearry, T. W. Ellsberry Survey, 5½ miles west of Jacksboro, recovered 4 bbl. of oil, 7 bbl. of oil-cut mud, and 3 gal. of brackish salt water on a 1-hour drill-stem test in Strawn sand from 3,332-37 ft. Operators were running casing at last report.

Hill & Hill and Wrightsman Oil Co. staked location for a semiwildcat in the Maguire-Roper area, 1 mile northwest of Joplin field. The 4,600-ft. test is to be the 1 J. E. Terry, located 330 ft. from south and west lines, Section 22, Block 2, Henderson CSL Survey, A-275.

In Fisher County, Gem Oil Co. 1 Marcos Medrona, 104-2-H&TC, Ellenburger prospect 8 miles west of Rotan, was scheduled to drill plug on 5½-in. casing set on bottom at 7,073 ft., and perforate from 6,957-7,000 ft.

In Montague County, General American Oil Co. 1 Hinds Clark, semiwildcat 8 miles west of Fruitland, W. D. Redd Survey, A-637, ran a 2-hour drill-stem test of the upper Caddo from 5,793-5,845 ft. Gas showed in 20 minutes and recovery was 1,260 ft. of fluid, being 720 ft. of clean oil plus 540 ft. of heavily oil-cut mud. Flowing pressure was 325 psi., and shut-in pressure in 20 minutes was 2,175 psi. At last report it had drilled ahead to 5,903 ft. and was preparing to run electrical survey.

Completion report was made on Jack Grace Production Co. 1 Emma Seago, wildcat 5 miles northeast of Nocona in the J. O'Leary Survey, A-1314. From perforations in the Cambrian at 5,075-80 ft., it flowed 228 bbl. of oil a day through 16/64-in. choke. Gas-oil ratio was 528 cu. ft., gravity was not reported. Casing pressure was 625 psi. Total depth was 5,110 ft., with 7-in. casing set to 5,097 ft.

Standard Oil Co. of Texas and Reno Oil Co. filed application to drill a 4,000-ft. rotary wildcat 4 miles northwest of Spanish Fort. It is to be the 1 Cato heirs, located approximately 3,750 ft. from east and 2,750 ft. from north lines, F. Robertson Survey, A-620. Location is 2 miles southeast of the shallow Nocona field, and 12 miles north of deep production in the Dodson field.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) SUCCESSFUL WILDCATS

Brown County: Neil K. Shaw 1 Shaw, D. J. Jones Sur. 50, 2 mi. S Brownwood, TD 1,764 ft., elev. 1,393 ft., PB 1,578 ft., pay 1,566 ft., IP flowed 150,000 cu. ft. of gas daily.

Coleman County: J. H. Dunn 1 W. Blevins, Sec. 62, HT&B Sur., ½ mi. S Santa Anna, TD 1,736 ft., elev. 1,694 ft., pay 1,714 ft., IP flowed 2,000,000 cu. ft. of gas daily, TP 700 psi.

Montague County: Jack Grace Production Co. 1 Emma Seago, J. O'Leary Sur., A-1314, 5 mi. NE Nocona, TD 5,110 ft., elev. 978 ft., perforated Cambrian 5,075-80 ft., IP flowed 228 bbl. oil a day, 16/64-in. choke, GOR 528 cu. ft., TP 180 psi., CP 625 psi.

Shackelford County: Hedrick Oil Co. 5 C. A. Nail, Sec. 120, ETRR Sur., 13 mi. NW Albany, TD 1,369 ft., IP pumped 8 bbl. 35°-grav. oil a day.

NORTH CENTRAL TEXAS (DISTRICTS 9 9 AND 7-B) WILDCAT FAILURES

Archer County: Bay Petroleum Corp. 1 F. McAnally & Olin Calvin, M. W. Mathews Sur., A-279, 5 mi. N Megargel, dry, TD 5,371 ft., elev. 1,184 ft., Caddo 4,923 ft., Mississippian 5,306 ft.

W. G. Gouchie 1 A. J. DeMoss, 17-5-Clark & Plumb Subd., 3½ mi. SE Archer City, dry, TD 1,095 ft.

Oltex Drilling Co. 1 J. H. Turbeville, Blk. 17, Harris Subd., 8 mi. W Archer City, dry, TD 1,494 ft.

Brown County: Pioneer Oil & Gas Co. 1 Hannis Estate, Waco Mfg. Co. Sur. 75, 2 mi. W Winchell, dry, TD 1,103 ft., elev. 1,337 ft., Caddo 712 ft., Ranger 1,080 ft.

Comanche County: W. H. Bryant 2 E. D. Ward, James Madison Sur. 40, A-679, 2 mi. WSW Sidnay, dry, TD 2,805 ft., elev. 1,474 ft., Ellenburger 2,730 ft.

O. H. Parker 1 O. A. Ferrill, Oliver Hall Sur., A-499, 3 mi. SE Sidney, dry, TD 2,894 ft., elev. 1,513 ft., Ellenburger 2,625 ft.

Cooke County: Steimel & Hutson 1 E. F. Blakely, S. S. Hale Sur., A-1387, 8 mi. NE St. Jo, dry, TD 2,906 ft.

Eastland County: M. D. St. John 1 Johnny Aaron, 4-3-H&TC, 5 mi. SW Eastland, dry, TD 3,615 ft., Caddo 2,949 ft., Marble Falls 3,252 ft., Ranger 3,509 ft.

Jack County: S. D. Johnson and others 1 G. A. Johnson, C. Vandever Sur., A-867, 6 mi. NW Jacksboro, dry, TD 5,040 ft.

Jones County: Anderson & Ward 1 F. C. Hodges, Sec. 6, Alex Bell Sur., 1½ mi. S Nugent, dry, TD 2,176 ft., Bluff Creek

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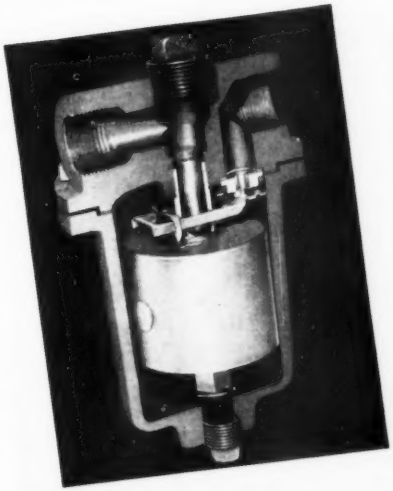

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C. U. Bay 1 Carl Jackson, M. Fragosa Sur., A-267, 3 mi. E Noodle, dry, TD 4,713 ft., elev. 1,811 ft., Flippen 2,632 ft., Gunsight 2,960 ft.

Lampasas County: C. B. Hamill 1 H. G. Glover, Sarah Pennington Sur., 10 mi. SW Lampasas, dry, TD 1,583 ft., Barnett 1,385 ft., Ellenburger 1,395 ft.

Stephens County: Russell Maguire 1 W. Gentry, 10-7-T&P, A-1317, 11 mi. S Breckenridge, dry, TD 2,460 ft., elev. 1,316 ft.

McElroy Ranch Co. 1 H. W. Sayle, Sec. 1265, TE&L Sur., 7 mi. NW Breckenridge, dry, TD 4,458 ft., elev. 1,164 ft., Caddo 3,303 ft., Barnett 4,271 ft., Chester 4,338 ft., dolomite 4,396 ft.

Taylor County: Hickok & Reynolds, Inc., 3 W. B. Payne, 5-4-Burr & Caswell Sur., 9 mi. S Merkel, dry, TD 3,440 ft., elev. 2,102 ft.

Robinson-Puckett, Inc., 1 J. D. Hamilton, Wm. B. Hardin Sur. 130, 3 mi. N View, dry, TD 3,426 ft., Dotham 1,988 ft., Flippen 2,390 ft., Gunsight 2,790 ft., Reef 3,187 ft.

OHIO, KENTUCKY

Five Wells Drilled in In Perry County Pool

COLUMBUS—Five wells have been drilled in the new pool south of Roseville in Harrison Township, Perry County; two were very good, two were small and one was dry. The National Gas & Oil Co. 1 John H. Owens, Section 9, logged the Clinton at 3,475-3,536 ft. with 35 bbl. in 24 hours natural. After a 120-qt. shot, the well tested 150 bbl. in the first 24-hour period. The Geo. Sharp et al (Bert Davis) 1 Theo. Strahl, Section 9, filled up to the top before shot and is expected to make 100 bbl. or better.

H. A. Baughman drilled a wildcat through the Clinton horizon on fee property in Lot 24, Tract 14, Henrietta Township, Lorain County, without finding any sand. An oil and gas showing in the Newburg at 1,635-70 ft. will be acidized after plugging back from a total depth of 2,201 ft.

M. B. Belden Co. extended the Bethlehem Township, Stark County, gas pool $\frac{1}{2}$ mile to the east with a small gasser on Olga Schegel, Section 13. Clinton at 4,680-4,700 ft. made 360,000 cu. ft. natural and shut in after shot with no increase.

WESTERN KENTUCKY

OWENSBORO—Confirmation of production recently opened in the area $\frac{3}{4}$ mile south of the most southerly limits of the Poole Consolidated pool, 3 miles southeast of Poole, Webster County, is being given at a north offset to the discovery well. The confirmation well, Iley Browning, Jr., 1 Norris Crowley, SE NE SE 13-N-23, is preparing to test good saturation found in Palestine sand at 1,631-41 ft. Casing was run through the sand to 1,720 ft., and sand will be tested by opening an alloy section in the string opposite the pay. Hole was drilled to 2,674 ft. and plugged back to the bottom of the casing.

The discovery well, 1 Osborne Heirs, is producing from Hardinsburg sand at 2,004-20 ft., in which it was completed as a 105-bbl. pumper. However, it also had good saturation in the Palestine sand at 1,625-31 ft., from which it swabbed at the rate of $1\frac{1}{2}$ bbl. of oil per hour in initial test.

Cherry-Kidd 1 Wilson, C S$\frac{1}{2}$ 8-O-22, a wildcat south of Corydon and northwest of production in the Dixie area, southwestern Henderson County, swabbed at the rate of 2 bbl. of oil natural while cleaning out to test Cypress sand at 2,188-92 ft. (Total depth 2,194 ft.). Pay was shot with 20 qt.

Delta Drilling Co. 7 Walker heirs most southwesterly well in the new Caney Mound East pool, in 13-P-20, Union County, is another good producer for the area. It flowed at the rate of 500 bbl. of oil natural through casing while testing the pool's O'Hara lime pay zone at 2,511-34 ft. The pool, discovered last August, and marked by the completion of a succession of prolific producers, now has 12 wells with only 2 dry holes having been drilled.

EASTERN KENTUCKY

ASHLAND—In Carter County 25-X-78 the wildcat test of Arch Carpenter on the Virgil Ramey tract was shut down for orders after shooting St. Peter sand 3,588-3,606 ft. and failing to establish commercial production. Previously the well had been carried on into the underlying Knox dolomite to a total depth of 3,840 ft. where water was encountered.

Year's end found slow progress being made at Coolie Ellis et al., 1 Merley 9-C-50, Cumberland County, in the southern portion of the state. After getting hole full of water, operators were reaming hole at 2,233 ft. in order to land casing through water zone before drilling deeper. No geological tops have been released to date on this key wildcat.

The most active field in eastern Kentucky for 1949 was Big Sandy gas pool where intensive drilling continued throughout the year. Recent completions in this field included: Kentucky West Virginia Gas Co. 937 R. Thompson, Pike County, 958,000 cu. ft. of gas daily from Devonian black shale at a total depth of 3,025 ft.; United Fuel Gas Co. 1 Wilda Young, Map Square 16-9 Pike County, 1,476,000 cu. ft. of gas daily from the black shale at total depth 3,798 ft.

EASTERN KENTUCKY WILDCAT FAILURE

Carter County: Dave Compton 1 Heber Ratcliff, Lost Fork of Crooks Creek, dry, TD 1,447 ft., Big lime 775 ft., Injun sand 930 ft., Berea 1,362 ft., $\frac{3}{4}$ bbl. oil per day after shot.

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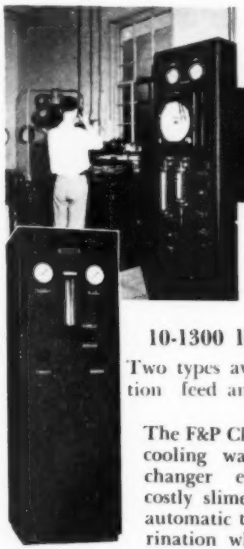

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WRITE FOR CATALOG *61*

FISCHER & PORTER CO. Dept. OL-3E Hatboro, Pa.

INDIANA

EVANSVILLE.—A new pay zone, the Waltersburg sand, is in prospect for the Hovey Lake area, in the southern tip of Posey County, where good saturation has been found in this sand at Sinclair Oil & Gas Co. 1 Klein, SE SE SE 13-8s-14w. Sand is at 1,855-72 ft. with casing run to 1,854 ft. Hole was drilled to 2,724 ft. but lower zones productive in the area did not show for commercial production. This area is about 2 miles southeast of the comparatively new Spencer pool, where prolific production is being developed in the McClosky lime.

Productive limits of the main part of the latter pool are being extended both to the north and to the west by two additional wells now being completed. Carter Oil Co. 3 Erin Hastings, NW SE SE 2-8s-14w, north outpost, is testing good saturation in McClosky lime at 2,859 ft. The same company's 2 Blanch Hastings, SE SW NW, same section, west of production, is testing with saturation at 2,872-80 ft., 2,888-96 ft. and 2,946-64 ft.

Two confirmation wells are being completed in the recently opened Pelzer pool, 5 miles south of Boonville, in Warrick County. Ashland Oil & Refining Co. and associates 1 Helm-Powell, NW NW SW 23-6s-8w, south offset to the discovery well (V-T Drilling Co. 1 Tom Helm) is being put on the pump after swabbing tests in which it made 3½ bbl. of oil per hour from the Cypress sand pay at 1,595-97 ft. V-T Drilling Co. 1 Helm-Stitch Community, north offset to the discovery well, is testing this pay at 1,554-57 ft.

INDIANA WILDCAT FAILURES

Gibson County: Ryan & Sharp 1 Kolb, SW SW NE 28-1s-10w, dry, TD 1,938 ft.

Greene County: Winmar Oil Co. 1 Allen, NW SE NW 22-7n-6w, dry, TD 1,821 ft.

Warrick County: John Buchman 1 Hendrickson, NE NE SW 24-5s-7w, dry, TD 1,505 ft.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Washington 25, D.C. Notice is hereby given that the lands listed herein are offered through sealed bids on the terms hereinafter specified, to qualified bidders of the highest cash amounts per acre as a bonus for the privilege of leasing the lands under sec. 17 of the Leasing Act of February 25, 1920 (41 Stat. 437; 30 U.S.C. sec. 181), as amended. All bids must be submitted to the Director, Bureau of Land Management, Washington 25, D.C., on or before 1 p.m. of the date set out herein. Each bidder must submit with the bid one-fifth of the amount bid in cash or by certified check on a solvent bank or by money order made payable to the order of the Treasurer of the United States, and file the showing of qualifications to receive a lease required under 43 CFR 192.42 (a) (2), and (a) (3), Circular 1730. The envelopes should be plainly marked that they are not to be opened before the date and hour set out herein, and should show the number of the parcel and the name of the field. No bids received after the hour fixed herein for receiving bids will be considered. The remainder of the bonus and the annual rental must be paid and an acceptable surety bond in the sum of at least double the amount of rental, but in no case less than $1,000 nor more than $5,000, must be furnished by a successful bidder prior to the issuance of a lease. An acceptable $5,000 surety bond will be required prior to commencing drilling operations on the land. The deposits of the other bidders will be returned upon acceptance of the successful bids. Bidders are warned against violation of section 1860, Title 18, U. S. Code, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids. Royalties payable to the United States will be at the rate of 12½ per cent to 25 per cent for oil, and 12½ per cent to 16 2/3 per cent for gas, in accordance with Schedule B in the lease form. Annual rental will be at the rate of $1.00 per acre. The lands are in the known geologic structure of the Bolton Creek field and are offered in the following parcels, all in T. 29 N., R. 81 W., 6th P. M., Wyoming: Parcel No. 1, Sec. 4 $S\frac{1}{2}NE\frac{1}{4}$, $SE\frac{1}{4}NW\frac{1}{4}$, $NE\frac{1}{4}SW\frac{1}{4}$, 160 acres. Parcel No. 2, Sec. 10, $N\frac{1}{2}SW\frac{1}{4}$, 80 acres. Total, 240 acres. Bids must be submitted on or before 1 p.m., January 18, 1950, and must be submitted on each parcel separately, but no objection will be made to the award of both parcels to the same successful bidder. Marion Clawson, Director

MICHIGAN

New Traverse Discovery For West-State Area

MOUNT PLEASANT.—Swabbing and flowing 90 bbl. of net oil first 24 hours after acidization with 1,000 gal. in a top Traverse pay, Mercer Oil Co. 1 Brazee, NW SW NW 13-14n-18w, Benona Township wildcat, Oceana County, appeared to be a new Traverse oil discovery for the west-state area.

Mercer originally logged this encouraging Traverse oil show late in November, but when acid was applied with 5-in. casing set on packer, casing seat was lost. Well was deepened to the lower Traverse, Dundee, and Monroe horizons, all of which were dry, before hole was plugged back and retested in the upper Traverse.

Traverse lime was logged at 1,670 ft., oil pay at 1,670-37 ft., Dundee at 2,155 ft., and Reed City-Monroe zone at 2,233 ft. Hole was bottomed out at 2,276 ft., dry in the lower horizons, and then plugged back to 1,679 ft. When first tapped Traverse pay showed about three bailers of oil overnight which was treated with 200 gal. of acid.

Operators estimated the 1 Brazee to be good for about 40 bbl. a day after recompletion. This wildcat followed a Carter Oil Co. core-drill program in the district and both Mercer and Carter were reported to have more locations set for the drill around this strike early in 1950.

Superior Oil Co. 1 Kenyon, NE NW SW 12-20n-1w, Butman Township Richfield zone test, Gladwin County, was acidized in this

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Washington 25, D. C. Notice is hereby given that the lands listed herein are offered through sealed bids on the terms hereinafter specified, to qualified bidders of the highest cash amounts per acre as a bonus for the privilege of leasing the lands under sec. 17 of the Leasing Act of February 25, 1920 (41 Stat. 437; 30 U.S.C. sec. 181), as amended. All bids must be submitted to the Director, Bureau of Land Management, Washington 25, D. C., on or before 1 p.m. of the date set out herein. Each bidder must submit with the bid one-fifth of the amount bid in cash or by certified check on a solvent bank or by money order made payable to the order of the Treasurer of the United States, and file the showing of qualifications to receive a lease required under 43 CFR 192.42 (a) (2) and (a) (3) Circular 1730. The envelopes should be plainly marked that they are not to be opened before the date and hour set out herein, and should show the number of the parcel and the name of the field. No bids received after the hour fixed herein for receiving bids will be considered. The remainder of the bonus and the annual rental must be paid and an acceptable surety bond in the sum of at least double the amount of rental, but in no case less than $1,000 nor more than $5,000, must be furnished by a successful bidder prior to the issuance of a lease. An acceptable $5,000 surety bond will be required prior to commencing drilling operations on the land. The deposits of the other bidders will be returned upon acceptance of the successful bids. Bidders are warned against violation of section 1860, Title 18, U. S. Code, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids. Royalties payable to the United States will be at the rate of 12½ per cent to 25 per cent for oil, and 12½ per cent to 16⅔ per cent for gas, in accordance with Schedule B in the lease form. Annual rental will be at the rate of $1.00 per acre. The lands are in the known geologic structure of the Thornburg field, Colorado, and are offered in the following parcels, all in T. 3 N., R. 91 W., 6th P.M.: Parcel No. 1, sec. 8, lot 16 ($SE\frac{1}{4}SE\frac{1}{4}$) 41.59 acres, Parcel No. 2, sec. 17, $E\frac{1}{2}NW\frac{1}{4}$, 80 acres, Total 121.59 acres. Bids must be submitted on or before 1 p.m., January 18, 1950, and must be submitted on each parcel separately; but no objection will be made to award of both parcels to the same successful bidder. Marion Clawson, Director

objective with 2,000 gal. at 4,920-79 ft. Previous tests after zone was jet-perforated between 4,874-4,979 ft., showed some free oil and gas, but salt water was also showing from best section, 4,921-31 ft., when swabbing with tubing set on an inverted packer. It was believed that packer failed under acidizing pressures and tubing was scheduled to be pulled and rerun. All indications were that Superior had a small Richfield producer at the 1 Kenyon.

MICHIGAN WILDCAT FAILURES

Oceana County, Benona Township: Robert Devin and J. W. Lang Co. 1 Levin, NE SE SE 17-14n-18w, Monroe 2,198 ft., dry, TD 2,276 ft.

Pentwater Township: Meil Wagenaar and Edward Wagner 1 Bryant, NW NW SW 26-16n-18w, Monroe 2,185 ft., dry, TD 2,261 ft.

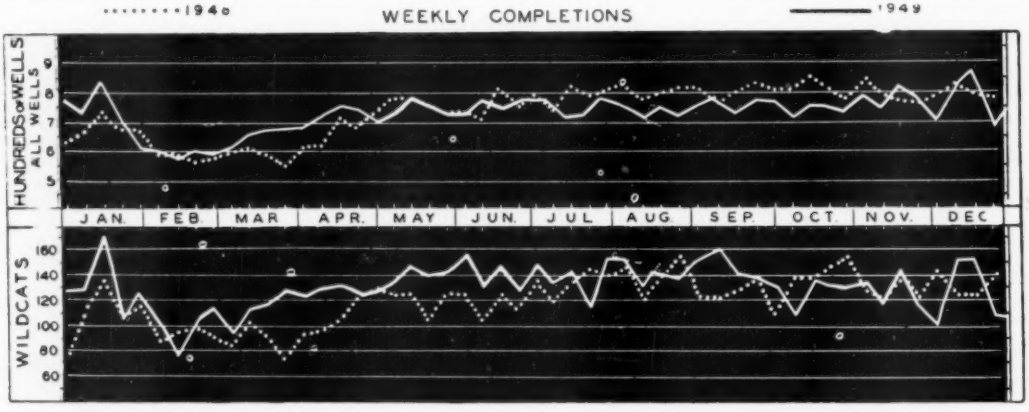
LEGAL

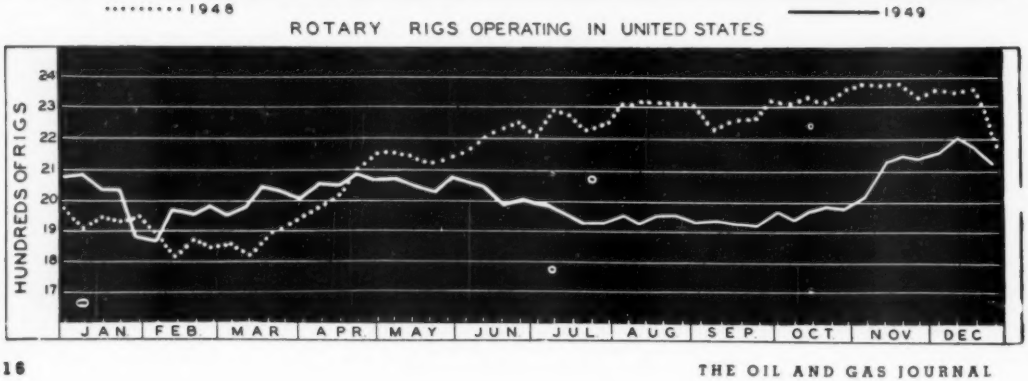
Department of the Interior, Wind River Indian Agency, Fort Washakie, Wyoming, December 23, 1949. Notice is hereby given that *SEALED BIDS* will be received until 2:00 p.m. January 26, 1950, and opened at that time in the Office of the Superintendent of the Wind River Indian Agency, Fort Washakie, Wyoming, for the leasing of the following unit of tribal land, located in Fremont County, Wyoming, for oil and gas mining purposes: UNIT NO. 1. $SE\frac{1}{4}$ Section 8; $W\frac{1}{2}$ $SW\frac{1}{4}$ Section 9; $E\frac{1}{2}$, $E\frac{1}{2}$ $W\frac{1}{2}$ Section 17; $E\frac{1}{2}$, $E\frac{1}{2}$ $W\frac{1}{2}$ Section 20; $NE\frac{1}{4}$, $E\frac{1}{2}$ $NW\frac{1}{4}$ Section 29, all in Township 1 South, Range 3 East, W.R.M., Wyoming, containing 1440 acres, more or less. The foregoing unit of tribal land is being offered as a single unit, and a lease will be drawn on the applicable Government form. The right is reserved to reject any and all bids. The successful bidder will be required to pay the cost of the advertisement. The lessee must pay as advance rental $1.25 per acre per annum. The lease will be sold to the highest bidder for a bonus offer upon an *acreage basis* in addition to the royalty of $12\frac{1}{2}\%$. The successful bidder must deposit with the Superintendent of the Wind River Indian Agency, on the date of the sale, a certified check or bank draft on a solvent bank in an amount equal to 20% of the bonus bid and of the first year's rental, as a guaranty of good faith. The check is to be made payable to the TREASURER OF THE UNITED STATES. The lessee will be required to use diligence in drilling and producing operations and shall commence the drilling of a test well within one year from date of approval of the lease and diligently continue drilling to test to the satisfaction of the U. S. Geological Survey the oil producing possibilities of the formations to a depth of 5,000 feet or to the Mesaverde sands, unless oil or gas in commercial quantities is found at a lesser depth, or, in lieu thereof, to drill two or more test wells with an aggregate drilled footage of 5,000 feet and each succeeding well to be started within six months of the abandonment of the previous test well. The lease must be completed and filed with the Superintendent within 20 days from the date it is received by the lessee for execution and returned with the remainder of the bonus bid, the balance of the first year's rental, a filing fee of $10.00, and the cost of the printed forms. Failure in any of these conditions may subject the bid to cancellation without further notice and forfeiture of payments already made. The lease on the above tribal unit will be drawn pursuant to the Act of May 11, 1938 (52 Stat. 347) and the regulations, Part 186, Title 25, C.F.R. The lease issued pursuant to this notice will be made for a term of ten years from the date of approval by the Commissioner of Indian Affairs and as long thereafter as oil and/or gas is produced in paying quantities. The rate of royalty will be $12\frac{1}{2}\%$ of the value of all oil, gas, and/or natural gasoline, unless the lessor, with the approval of the Commissioner of Indian Affairs, elects to take royalty in kind. The adequacy of the bonus offer will be determined by the U. S. Geological Survey. A suitable bond will be required, and such bond must be approved by the Commissioner of Indian Affairs. The responsibility of complying with any requirements of the Federal Documentary Stamp Statutes will be left with the successful lessee. All bids should be addressed to the "Superintendent, Wind River Indian Agency, Fort Washakie, Wyoming" in a plain envelope marked: BID FOR OIL AND GAS MINING LEASE, RIVERTON DOME, TO BE OPENED AT 2:00 P.M. JANUARY 26, 1950. For further information, call or write the Land Division of the Wind River Agency.

WEEKLY WELL COMPLETIONS . . WEEK ENDED DECEMBER 31, 1949

	Total of all wells							Wildcat completions and discoveries									
						Dec. 31							Cumulative total, 1949				
	Comp.	Oil	Gas	Dry	Footage	1949	1948	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	18	9	0	*9	28,429	760	1,475	0	0	0	0	0	0	0	1	0	1
Pennsylvania	24	10	1	‡13	40,201	1,843	2,528	0	0	0	0	0	0	0	4	2	6
West Virginia	12	3	7	2	26,879	519	846	0	0	0	0	0	1	0	12	11	24
Ohio	27	9	9	9	49,780	1,087	1,415	0	0	0	0	0	3	0	2	30	35
Indiana	18	6	0	12	30,983	1,287	1,121	0	0	0	3	3	37	0	4	223	264
Kentucky	26	6	13	7	71,707	1,047	908	0	0	0	2	2	29	0	0	79	108
Illinois	42	20	0	‡22	98,769	2,760	2,509	1	0	0	1	2	64	0	4	488	556
Michigan	6	3	0	3	16,504	982	895	0	0	0	2	2	29	0	3	305	337
Kansas	71	33	15	‡23	227,694	3,344	3,284	2	0	0	7	9	77	0	9	428	514
Neb., Mo., Iowa	1	1	0	0	4,554	33	62	1	0	0	0	1	3	0	0	18	21
Oklahoma	82	52	3	‡27	299,588	4,362	4,293	3	0	0	11	14	114	15	17	618	794
Texas	285	186	7	92	1,193,092	13,221	12,251	8	1	2	49	60	395	44	116	2,231	2,786
North Central (Dist. 7-B & 9)	112	63	2	‡47	293,756	4,423	3,850	2	0	2	16	20	174	0	22	871	1,067
West (Dist. 7-C & 8)	65	59	0	6	384,379	3,232	3,251	1	0	0	2	3	63	1	6	269	339
Panhandle (Dist. 10)	8	4	2	2	33,170	940	666	0	0	0	1	1	1	0	1	10	12
Eastern (Dist. 5, 6, & 6-P)	38	26	0	12	133,800	816	631	1	0	0	10	11	13	4	4	163	184
Gulf Coast (Dist. 2 & 3)	37	21	3	13	233,441	1,952	1,896	1	1	0	13	15	79	30	48	379	536
Southwest (Dist. 1 & 4)	25	13	0	12	114,546	1,858	1,957	3	0	0	7	10	65	9	35	539	648
Louisiana	49	36	3	10	200,452	2,335	2,325	1	0	0	1	2	54	21	4	203	282
Northern	34	25	3	6	62,868	1,424	1,554	0	0	0	0	0	6	3	0	97	106
Southern	15	11	0	4	137,584	911	771	1	0	0	1	2	48	18	4	106	176
Arkansas	0	0	0	0	0	317	309	0	0	0	0	0	3	1	1	71	76
Mississippi	4	2	0	2	34,556	330	428	0	0	0	1	1	6	2	1	105	114
Southeastern States	1	0	0	1	11,520	48	53	0	0	0	1	1	1	0	0	38	39
Montana	0	0	0	0	0	278	345	0	0	0	0	0	5	0	2	33	40
Wyoming	13	10	0	3	62,562	600	633	0	0	0	0	0	24	0	1	116	141
Colorado-Utah	2	0	1	1	10,405	136	240	0	0	1	1	2	3	0	1	68	72
New Mexico	8	4	1	3	34,814	494	605	0	0	0	2	2	13	1	2	53	69
California	36	27	0	9	179,176	2,567	2,878	0	0	0	6	6	36	0	7	439	482
Dakotas	0	0	0	0	0	18	2	0	0	0	0	0	0	0	0	15	15
Tennessee	0	0	0	0	0	35	58	0	0	0	0	0	5	0	0	24	29
Total United States	725	417	60	248	2,651,665	38,403	39,463	16	1	3	87	107	932	84	191	5,598	6,805
Total previous week	677	376	39	262	2,394,116			9	1	2	96	108	916	83	188	5,511	6,698
Total January 1, 1949	774	433	53	288	2,790,649			5	3	7	108	123	863	83	246	5,153	6,345

Service wells included: *9, ‡11, ††1.





DAILY AVERAGE PRODUCTION FOR WEEK

	Dec. 31 crude oil	†B. of M. demand	Dec. 24 crude oil
Alabama	1,600		1,450
Arkansas	74,650		74,500
California	867,100		868,000
Colorado	63,600		60,500
Eastern	58,600		58,200
Florida	830		935
Illinois	178,000		176,400
Indiana	27,800		28,400
Kansas	273,750		286,450
Kentucky	25,100		25,100
Louisiana	536,900		536,500
North Louisiana	121,300		120,900
South Louisiana	415,600		415,600
Michigan	43,100		45,750
Mississippi	101,500		92,550
Montana	24,200		24,900
Nebraska	1,450		1,450
New Mexico	131,800		131,800
Oklahoma	409,650		410,600
Texas	1,976,700		1,976,700
Dist. 1 (Southwest)	26,000		26,000
Dist. 2 (Southwest)	116,625		116,625
Dist. 4 (Southwest)	185,825		185,825
Dist. 3 (Gulf Coast)	366,775		366,775
Dist. 5 (Eastern)	33,800		33,800
Dist. 6 (Eastern)	83,900		83,900
East Texas field	236,000		236,000
Dist. 7-C (West)	51,075		51,075
Dist. 8 (West)	582,400		582,400
Dist. 7-B (W. Central)	61,375		61,375
Dist. 9 (N. Central)	140,525		140,525
Dist. 10 (Panhandle)	92,400		92,400
Utah	3,200		2,900
Wyoming	134,300		138,700
Total United States	*4,935,830		4,941,785
Change from previous week, down 5,955			
Canada			58,490

Total U. S. production January 1-December 31 †1,852,064,785 bbl.
Same period last year (crude plus cond.) 2,017,957,455 bbl.

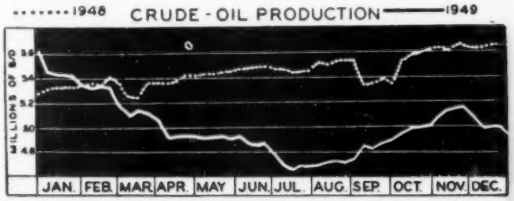
*Not incl. 83,945 bbl. condensate. †Incl. 30,023,095 bbl. condensate. ‡December demand not announced.

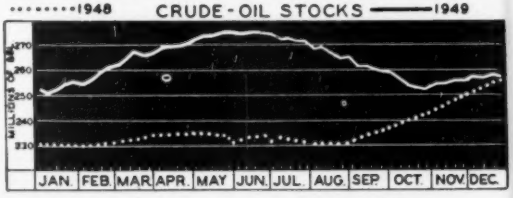
CRUDE-OIL STOCKS BY STATES OF ORIGIN*

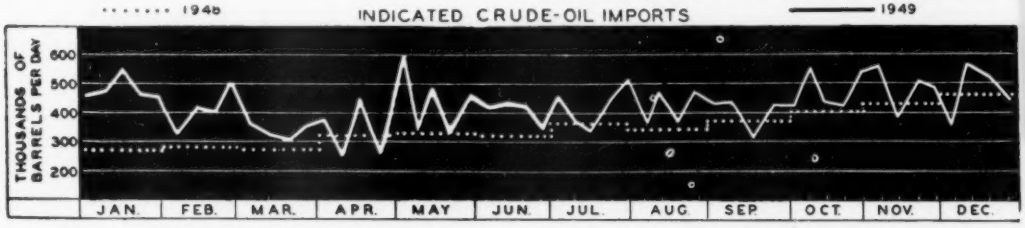
(Thousands of barrels)

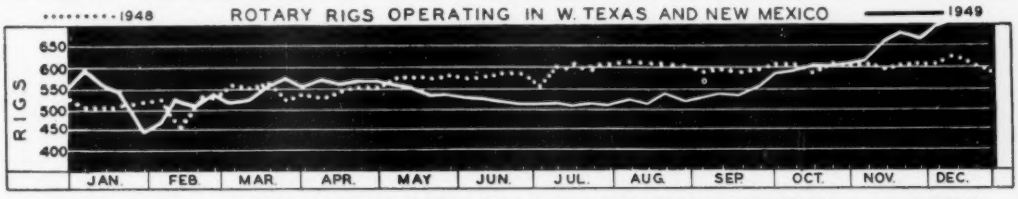
	Dec. 24, 1949	Dec. 17, 1949	Dec. 25, 1948
Pennsylvania Grade	2,831	2,857	2,918
Other Appalachian	1,908	1,916	1,363
Illinois, Indiana, Michigan	12,191	11,964	13,120
Arkansas	2,958	2,913	3,531
Louisiana	14,115	13,480	12,254
North	3,467	3,300	3,165
Gulf	10,648	10,180	9,089
Mississippi	2,149	2,404	2,782
New Mexico	7,471	7,529	6,517
Oklahoma and Kansas	38,147	37,611	36,605
Texas	116,572	117,369	117,918
East Texas	15,703	16,363	16,102
West Texas	43,623	43,619	45,598
Texas Gulf	30,687	29,931	28,843
Other Texas	26,559	27,456	27,375
Rocky Mountain	13,583	13,978	12,150
California	37,566	37,924	33,790
Foreign	7,339	8,031	7,607
Total United States	256,830	257,976	250,555

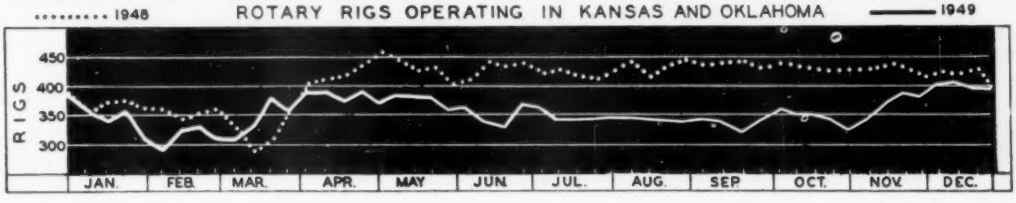
*Bureau of Mines.









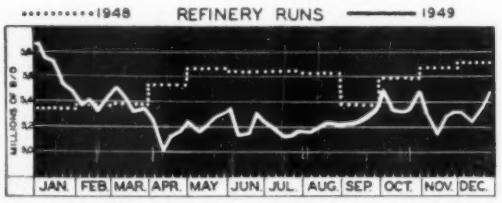


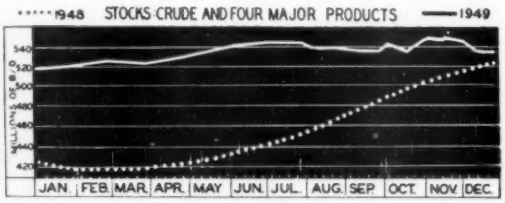
A.P.I. REFINERY REPORT, DECEMBER 24

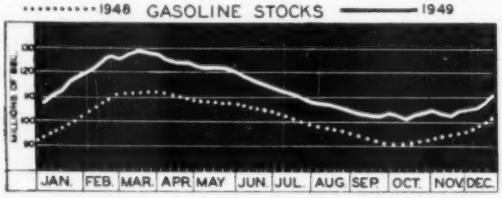
(Thousands of barrels)

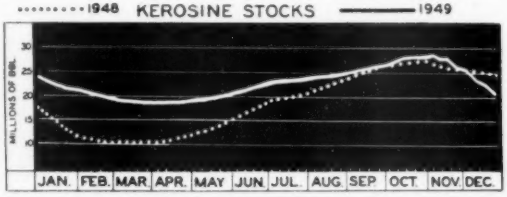
District	Daily avg. crude runs	Daily average production				Stocks at refineries, bulk terminals, in transit and in pipe lines				Bureau of Mines, December 1948				
		Gasoline*	Kerosine	Distillate	Residual	Gasoline†	Kerosine	Distillate	Residual	Daily avg. crude runs	Daily average production: Gasoline*	Kerosine	Distillate	Residual
East Coast	891	344.6	52.7	188.7	228.4	23,258	9,037	23,426	10,032	856	322.9	39.8	211.4	241.5
Appalachian:														
District 1	92	45.4	6.7	14.9	11.1	2,782	308	823	329	101	45.4	7.7	15.0	14.7
District 2	61	28.1	5.0	12.1	12.6	1,350	125	214	124	72	36.4	4.9	7.9	14.5
Ind., Ill., Ky.	978	490.0	59.6	177.1	166.3	22,075	4,056	11,273	3,646	939	483.1	62.5	152.7	158.7
Okla., Kans., Mo.	441	248.1	21.6	84.4	58.8	10,294	1,083	5,582	1,526	437	240.6	22.5	75.1	80.6
Inland Texas	194	135.9	9.0	19.0	34.9	3,976	516	999	1,043	250	162.0	14.8	22.3	59.3
Texas Gulf Coast	1,319	579.0	115.4	299.3	217.1	16,522	2,958	15,496	6,325	1,468	645.3	112.2	334.1	259.2
La. Gulf Coast	462	228.9	63.0	103.0	64.6	6,194	1,134	4,537	2,479	452	200.1	58.2	100.4	74.6
N. La. and Ark.	69	30.1	6.3	9.6	15.0	2,552	419	664	295	85	33.2	8.8	11.3	20.1
Rocky Mountain:														
New Mexico	12	6.6		1.9	3.0	91	30	85	30	14	7.5	0.5	2.1	3.7
Other Rocky Mtn.	172	82.9	4.8	31.3	35.3	3,357	411	1,884	640	152	71.6	4.3	26.4	34.9
California	791	358.3	16.6	106.6	302.3	17,713	940	13,679	35,178	965	378.1	13.8	151.7	399.9
December 24, 1949	5,482	2,577.9	360.7	1,047.9	1,149.4	110,164	21,017	78,662	61,647	5,791	2,626.2	350.0	1,110.4	1,361.7
December 17, 1949	5,389	2,618.4	365.0	1,037.6	1,150.8	108,490	22,267	82,450	62,786					
December 25, 1948	5,855	2,596.4	363.1	1,115.4	1,366.0	100,286	24,191	74,576	63,374					

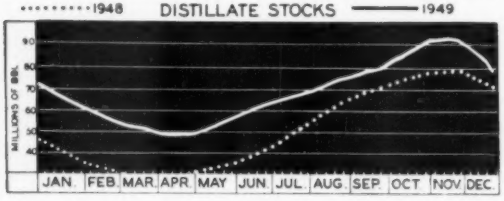
*At refineries including natural blended. †Finished and unfinished.

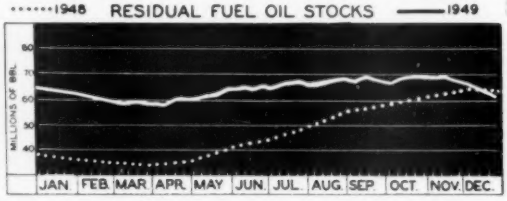




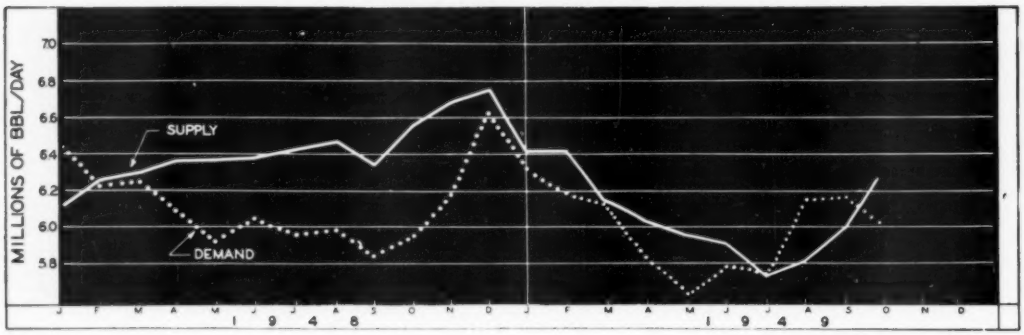








PETROLEUM SUPPLY AND DEMAND



CRUDE PRICES GRAVITY SCHEDULE

Gravity—	Calif. Hill, Signal	Kansas homa, Okla-	Tex.* Coast Gulf	Tex.† West
18-18.9	$1.53			
19-19.9	1.63			
20-20.9	1.73	$2.25		$2.12
21-21.9	1.82	2.27		2.14
22-22.9	1.92	2.29		2.16
23-23.9	2.02	2.31		2.13
24-24.9	2.12	2.33	$2.56	2.20
25-25.9	2.22	2.35	2.58	2.22
26-26.9	2.31	2.37	2.60	2.24
27-27.9	2.37	2.39	2.62	2.26
28-28.9	2.42	2.41	2.64	2.28
29-29.9	2.48	2.43	2.66	2.30
30-30.9	2.54	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.64	2.49	2.72	2.36
33-33.9		2.51	2.74	2.38
34-34.9		2.53	2.76	2.40
35-35.9		2.55	2.78	2.42
36-36.9		2.57	2.80	2.44
37-37.9		2.59	2.82	2.46
38-38.9		2.61	2.84	2.48
39-39.9		2.63	2.86	2.50
40 and above		2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947. Above changes do not include recent reductions of a few buyers applying principally to low-gravity grades.

FLAT CRUDE PRICES

Representative posted schedules per barrel.

East Texas†	$2.65
Kettleman Hills, California*	2.77
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.35
Bradford, Pennsylvania	3.54
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.83

*37°-37.9°. †35° and above.

A GENERAL summary of products markets for the Christmas-New Year week includes increasing firmness for kerosine and residual fuel, some softness in the East Coast distillate market, and a general downward trend for gasoline.

Kerosine stocks are dropping rapidly in the Gulf-East Coast area indicating a strong market for this product. For the two districts, stocks declined 16 per cent in the past 3 weeks and on December 24 were about 17 per cent below the year-end stocks for 1948. Price discounting in the Harbor area has disappeared, and little material is available on the Gulf Coast at 8.25 cents a gallon. Offers of up to 8.5 cents were reported but unconfirmed. It has been a little difficult for suppliers to estimate demand for kerosine as such since a large space-heating market in the northeastern states can use either kerosine or No. 1 fuel.

Warm weather in the New York-New England area for the last half of December has had a marked influence on the distillate market in the area. Barge price in New York Harbor dropped about 0.2 cent on the low to 8 cents a gallon. Stocks in the combined Gulf-East Coast area have been decreasing at a normal winter rate but are still about 2,500,000 bbl. high.

Despite increased imports and shipments from California, Gulf-East Coast stocks of residual fuel are down about 32 per cent from last year. Low-sulfur residual, supplied by domestic refiners, is particularly scarce. Domestic high-sulfur fuel is moving more slowly since it is in direct competition with imported residual.

Price increases for kerosine and No. 2 at the tank-wagon level in the Middle West may be indicators pointing toward further gains in the Group 3 spot market.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotations of leading suppliers as of January 3, 1950. Figures are f.o.b plant for tank-car shipments in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Tex. Gulf Coast
Regular gasoline, 74-76 octane	9½-10	10.5-11.1	9-9¾
Premium gasoline, 78-80 octane	10⅜-11	11.5-12.1	9¾-10¾
42-44 w.w. kerosine	8-8¼	8 9-9	7¾-8.25
No. 2 straw fuel oil	7-7⅜	8-8.5	7-7¼
No. 6 residual	$1.20-1.25	$2.05	$1.65-1.75

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	5⅞	5⅜	5⅝
Grade 18-55	7.1	6.5	6.8

LUBRICATING OILS SOUTH TEXAS

200 vis., No. 2-3 neutral	10.5
750 vis., No. 3-4 neutral	12.75
2,000 No. 5-6 neutral	14-14.5

LUBRICATING OILS

Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	17-19
200 vis., No. 3 neutral, 0-10 pp.	11.5-14

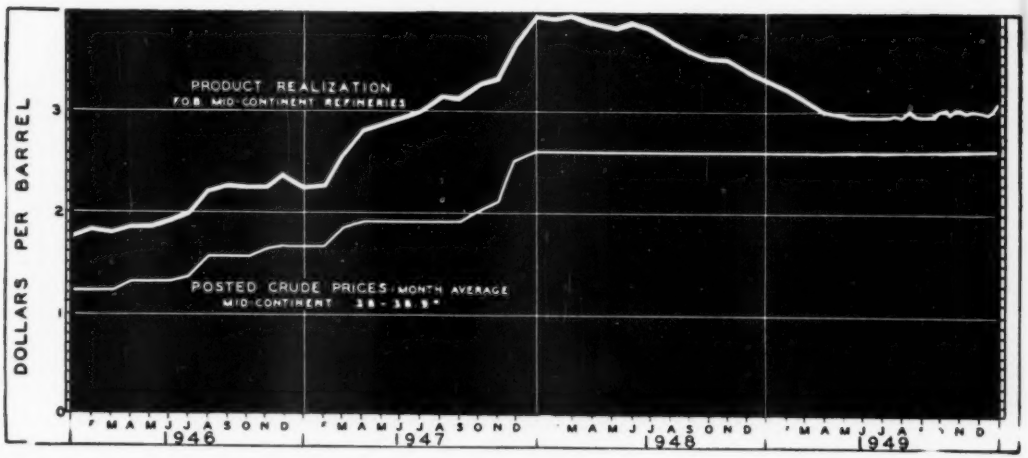
Western Pennsylvania

145-155 vis., 10 p.t. bright stock	19.5-20.5
180 vis., 0 p.t. neutral	20.5-21.5

WAX

Mid-Continent

132-134 A.M.P.	4.25



In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate, and fuel oil

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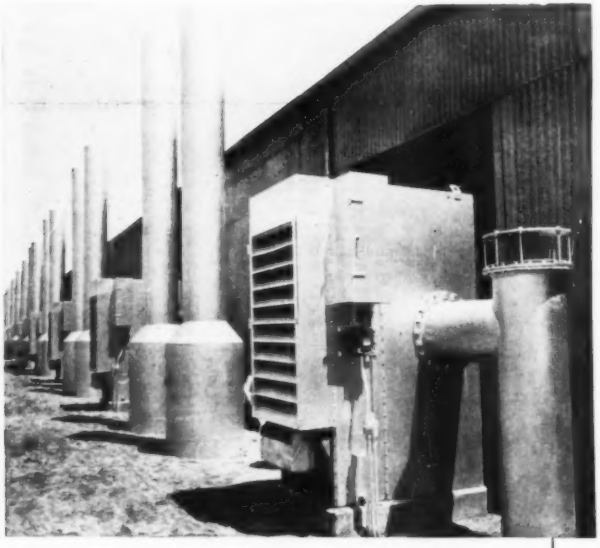
AAF Multi-Duty Filters selected again for major dust protection job



MULTI-DUTY TYPE CMS air filters have seen action in every major "dust bowl" area throughout the world—and they've won a clean-cut victory in every encounter. That's why they were selected to protect these eleven 1600 H.P. Cooper-Bessemer engines at this new Kansas pumping station.

The Multi-Duty Type CMS never relaxes its guard against dust. Overlapping panel construction assures both positive self-cleaning operation and delivery of uniform air volume. When once established, operating resistance remains fixed. Periodic inspection and regular sludge removal is the only attention required for dependable, 'round-the-clock protection.

For outdoor duty, these filters are equipped with louvres for weather protection and a plenum chamber to which intake is attached. A perforated metal baffle in plenum chamber dampens intake pulsations and distributes air flow uniformly over entire filter curtain area.

Don't endanger a major investment by adopting half-way dust protection measures. AAF Multi-Duty Self-Cleaning Filters assure you complete, low-cost dust control year in and year out.

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Contains complete data on Multi-Duty Filters for engines and compressors. Write for it now.

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AAF
AIR FILTERS
AND DUST CONTROL EQUIPMENT

EQUIPMENT MEN . . . in the News

Eckel and Jones Form New Mechanical Development Co.

J. E. ECKEL

M. R. JONES

John E. Eckel, formerly vice president in charge of engineering, Oil Center Tool Co., and Marvin R. Jones, former chief engineer of the same company, have formed Petroleum Mechanical Development Co., at 3803 South Main Street in Houston.

This company has been organized to develop new or improved oil tools and to consult on petroleum mechanical engineering. Excellent manufacturing facilities are available for the development and manufacture of new oil tools. These tools will be sold under the trade name "Petromec."

Eckel, as president, brings over 20 years of experience in oil-equipment engineering with Humble Oil & Refining Co. and Oil Center to the new organization. A registered petroleum mechanical engineer, he has devoted much time to his work on the standardization committees of the A.P.I.

Jones, the secretary-treasurer, has worked with such companies as American Iron & Machine Works, Hughes Tool Co., and Cameron Iron Works.

Wolcott, Houston Move Up In Lukens Steel Election

Robert W. Wolcott, president of Lukens Steel Co. since 1925, was named chairman of the board, and Charles Lukens Huston, Jr., vice president and executive assistant to the president since February 1948, was elected president of the company by action of the board of directors.

Wolcott has been associated with Lukens since 1922, serving first as manager of its warehouse and fabricating division in New Orleans. He became president of the company in 1925 and has held that position ever since. In addition to being president, Wolcott also served as a director of Lukens Steel Co. and is a director of the American Iron and Steel Institute; of the Pennsylvania State Chamber of Commerce; of York Corp.; of Wilmington & Northern Railroad; and of National Bank of Chester Valley, Coatesville, Pa.

Huston, a descendant of Isaac Pennock, founder of the business in 1810, became associated with Lukens in 1939, after 10 years with Armco Steel Corp. He was graduated from Princeton University in 1928, and the following year took graduate work at Massachusetts Institute of Technology. He joined Lukens as a director of personnel relations, subsequently becoming president of Lukenweld, machinery - making division of Lukens. In 1946 he became executive assistant to the president, and in 1948 he was elected vice president of Lukens.

Texlite Names Curington To Mid-Continent Area

J. C. CURINGTON

H. Harold Wineburgh, president of Texlite, Inc., porcelain - enamel manufacturers, has announced the appointment of J. C. Curington as resident district representative for Oklahoma, Arkansas, Kansas, and Missouri.

Texlite has recently opened new offices at 834 South Louisville, Tulsa. Associated with Texlite since October 1940, Curington was promoted to production manager during the war and served in that capacity until his recent appointment.

Altens Names Radican As District Salesman

Altens Foundry & Machine Works, Inc., Lancaster, Ohio, manufacturers of Alten pumping units and other oilfield production equipment, has announced the appointment of F. L. Radican as district salesman. Radican, who was formerly with Rollans-Elliot Co. of Tulsa, will supervise the sales and servicing of Alten equipment in the states of Kansas and Oklahoma with headquarters in Tulsa.

Broz to Manage Four Cycle Diesel Sales for Nordberg

J. G. BROZ

Appointment of Joseph G. Broz as sales manager of the four - cycle diesel - engine department has been announced by R. W. Bayerlein, vice president of the heavy machinery division, Nordberg Manufacturing Co.

Broz was vice president in charge of sales of Busch-Sulzer Diesel Engine Co. of St. Louis at the time that company was purchased by Nordberg in 1946. Until his present appointment Broz was surveying South American market potentialities and establishing field sales and service organizations there for Nordberg.

Prior to his association with Busch-Sulzer, Broz was with Baldwin Locomotive Works from 1930 to 1944. H. M. Cahill will assist Broz in directing the sales activities of Nordberg's four-cycle diesel-engine department.

T. D. Williamson Names Davis and Keyes Tank Co.

H. E. DAVIS

Keyes Tank Co's. of Salt Lake City and Casper, and Harold E. Davis of Los Angeles have been appointed distributors by T. D. Williamson, Inc., pipe-line equipment manufacturers of Tulsa.

Davis, formerly associated with Richfield Oil Corp., will have California as his territory. In addition to the Williamson account, he will represent other manufacturers of equipments required by the pipe-line industry.

Keyes' organization is headed by A. C. Keyes, president, and C. E. Spencer, general manager. Spencer was formerly tank superintendent for Stanolind Pipe Line Co. Recognized throughout the Rocky Mountain area as builders of tanks and tank fittings, Keyes operations are being expanded to include complete tank service for all types of industry. Territory includes Montana, Idaho, Wyoming,

Utah, Nevada, Colorado, New Mexico, South Dakota, and the western part of Nebraska.

Oil Well Manufacturing Adds Ray Morris to Staff

Best Dawson, sales manager, Oil Well Manufacturing Corp., Los Angeles, has announced the appointment of Ray Morris to head sales of Red Devil products in the Los Angeles Basin.

Morris was with Patterson-Ballagh for many years, a field supervisor for Baroid and more recently operated his own manufacturers' representative agency in Los Angeles.

Klaus and DeCoursin to Head Sales for F.W.D.

M. O. Stockland, Jr., director of sales of Four Wheel Drive Auto Co., has announced the appointment of W. G. Klaus as office sales manager for the company, and of G. F. DeCoursin as field sales manager.

Klaus has been assistant to the general manager and manager of manufacturers' sales since 1945. An employe of F.W.D. since 1934, he has had both field and office sales experience.

DeCoursin was promoted from manager of planning in the manufacturing division of the company to assistant to the director of sales in May of this year. Since that time he has spent most of his time on the road working with F.W.D. salesmen and distributors throughout the United States.

Stacey-Dresser Moves To Cincinnati Headquarters

Stacey-Dresser Engineering Division, Cleveland, is in the process of moving its headquarters to Cincinnati, according to an announcement made by H. N. Mallon, president of Dresser Industries, Inc.

E. A. Flaschar, general manager of Stacey-Dresser, will direct the coordination of the activities of his organization with those of its parent company, Stacey Brothers Gas Construction Co., a subsidiary of Dresser Industries. The future address of Stacey-Dresser Engineering Division becomes the same as that of Stacey Brothers.

American Iron & Machine Announces New Officers

Recently elected and appointed officers of American Iron & Machine Works Co. are: E. E. Rubac, vice president and assistant manager; Claude L. Griffin, sales manager; V. L. Thomas, secretary-treasurer; and M. G. McCool, president and general manager. Inset is J. A. Gray, chairman of the board

M. G. McCool, Oklahoma City, was elected president and general manager of American Iron & Machine Works Co., at the December 15 meeting of the board of directors. E. E. Rubac, Oklahoma City, was elected vice president and assistant general manager.

Other officers elected were: J. A. Gray, Houston, chairman of the board; V. L. Thomas, Oklahoma City, secretary-treasurer; Cecil N. Cook, Houston, vice president; and A. J. Farfel, Houston, assistant secretary. Claude L. Griffin, Oklahoma City, was appointed sales manager.

American Iron & Machine Works Co., located in Oklahoma City since 1926, manufactures oil-well drilling and production equipment. Its plant, completely modernized the past year, has recently begun the production of tool joints for drill pipe, in addition to its other equipment lines.

Ken Corp. Executive Goes To Venezuela for Pantepec

Earl Tavan, Jr., secretary - treasurer of Ken Corp., manufacturers of a new oil-base drilling fluid, left California the end of December for Venezuela. He will supervise engineering control on a test in the Roble field, in eastern Venezuela for Pantepec Oil Co. Tavan has had 20 years' experience in drilling-mud and production problems.

Ideco Executives Plan 1950 Sales Program

Ideco executives meeting to plan a sales campaign for 1950 are: Ferguson Barnes, vice president and general manager, Columbus plant; T. D. Collins, vice president, supply stores division; R. R. Bloss, vice president and general manager, Beaumont plant; G. W. Walton, vice president, machinery and export division; J. M. Gardner, president, Ideco; and J. D. McEwen, vice president and general manager, Torrance plant

Al Seaman Joins Oil Base

George Miller, president of Oil Base, Inc., Compton, Calif., has announced the addition of Al Seaman to the sales staff for Black Magic oil-base drilling fluid and mud-conditioning products.

Seaman was formerly with Baroid in the well-logging division, served with Macco in California and Wyoming, and in the Los Angeles basin for Oil Well Chemical Co. He will cover the San Joaquin Valley as a service engineer for Oil Base, Inc., with offices in Bakersfield.

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NEW Byron Jackson "Pup" Centrifugal Pumping Units with Chrysler Ind-9 engines — Army surplus — export boxed with parts and tools—condition perfect—supply limited—price attractive—available for immediate shipment from Houston.

HALLORAN EQUIPMENT CO.
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FOR SALE

12—230 H.P. Type 10 Bessemer New 17" Power Cylinders complete ready to run with 16" to 18" Compressors. 1—230 H.P. Clark Horizontal with Compressors. Located Salem, Illinois.

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THE FOLLOWING NEW NATIONAL TRANSIT STEAM PUMPS ARE BEING SOLD AT 40% OFF LIST PRICE:

2—Simplex 8"x5"x12", steel, side pot, HOT OIL. 1—Duplex 12"x7"x18", steel, side pot, HOT OIL. 1—Simplex 6"x7½"x12", steel, side pot, HOT OIL. 1—Simplex 6"x4"x6", steel, side pot, HOT OIL. 1—Simplex 10"x5"x12", steel, side pot, HOT OIL. 2—Simplex 6"x15"x12" Medium Hot Oil Service. 4—Simplex 6"x6"x18" Close Clearance. 3—Duplex 6"x3¾"x6". Heavy Fuel Oil Service. 1—Duplex 5¼"x4¾"x5". Hot Water Service.

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FOR SALE: 3,000 Ft. 10¾" O.D. 32#; 6,000 Ft. 8⅝" O.D. 24#; 4,000 Ft. 7" O.D. 20#; 10,000 Ft. 7" O.D. 17#; 14,000 Ft. 5½" O.D. 14#; 20,000 Ft. 2" tubing 4.6#; 50,000 Ft. 2" line pipe 4#. All of this pipe is exceptionally good quality used lapweld. Priced very reasonably. Can be inspected at Marietta. The Interstate Pipe & Supply Company, Marietta, Ohio. Phone 2468.

FRANKS Senior Well Servicing Unit with 8 x 10 inch, 50 foot mast. On Dodge truck. Location—California. Write Box D-324, The Oil and Gas Journal, Tulsa, Oklahoma.

Several Army Surplus 4½" x 6" Gaso Duplex 1860 Pumps—two piece skid mounted with Chrysler 8 cylinder engines. Will sell pumps only or complete units about half price.

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FOR CABLE TOOLS
DEGEN PIPE AND SUPPLY CO.
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FOR SALE: Two Fairbanks-Morse Diesel Engines, 150 H.P. Twin Cylinder, Horizontal Type. Completely overhauled. $1500.00 each. Melton Supply Co., Seminole, Okla.

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(Subject to Prior Sale)

5000 Ft. 9⅝", 36#, J55, Range 2, 8 Rd. Thrd. Seamless Casing
4000 Ft. 8⅝", 28# Ditto
19,000 Ft. 6" Std. Byars L.W. W.I. Pipe
Specification ASTM-AF2-33

Contact
National Cooperative Refinery Assn.
Phone 820 McPherson, Kansas

FOR SALE

5,600'—8⅝" O.D. 28# Lapweld T&C, Range 1
90,000'—6⅝" O.D. 17.65# Seamless, Range 3, Beveled
60,000'—6⅝" O.D. 19.79# Lapweld, T&C
80,000'—6" O.D. 9# New Invasion Pipe, Coated & Wrapped, range 3 tested 500# W.P. Beveled.
2—55,000 Bbl. All Steel Welded Tanks
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Sell cut down or standing. Located Longview, Tex.

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QUANTITY:	1637 Net Tons
SIZES:	1149 Ton 4½" x 131" 143 Ton 6⅛" x 95" 345 Ton 7½" x 87"
POTENTIAL USES:	**Forging Billets,** **Mechanical Tubing,** Hot Finished or Cold Drawn to Diameters 4½" to 8⅝", Wall Thickness Range ¼" to ½" **Oil Country Casing,** 5½" 17#; 7" 23#; 8⅝" 32# Range 2 Yield 95,000# Minimum as against N80—80,000#
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MOBILE workover rig now operating in Corpus Christi, Texas, area. Completely equipped for workovers to 7500'. Price $15,600 includes everything. Inventory on request. Box D-328, The Oil and Gas Journal, Tulsa, Oklahoma.

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100 KW DIESEL ENGINE GENERATOR SETS

10—100 kw., 120-240 v. D.C. Delco Generators dir. con. to 150 HP Model GBD-8, 5½x7, 8 cyl Superior DIESEL Engines, elec. start with engine panels
4—100 KW same as above with 220 or 440 v. NEW A.C. Generators
1—63 kva. 120-208 v. 3 ph. 60 cy. 1800 rpm., driven by Caterpillar DIESEL mt'd on trailer
2—75 kva. 220-440 v. 3 ph. 60 cy. Delco Cummins DIESEL
2—37½ kva., 220-440 v. 3 ph. 60 cy. Buda DIESEL
10—NEW 37½ kva., 220-440 v. 3 ph. 60 cy LeRoi Gasoline
1—31.3 kva. 120-208 v. 3 ph. 60 cy. G.E. Gen. driven by LeRoi GASOLINE
11—NEW 25 kva. 120-220 v. 1 ph. 60 cy. LeRoi GASOLINE
1—12½ kva. 120-240 v. 1 ph. 60 cy. 1200 rpm., dir. con. Hercules GASOLINE
4—12½ kva. 120-240 v. 1 ph. 60 cy. dir. con. LeRoi Gasoline Engines
1—7½ kva. 120 v. 3 ph. 60 cy. Wisconsin GASOLINE
6—3 kva. 110-220 v. 1 or 3 ph. Hercules GASOLINE

PORTABLE AIR COMPRESSORS

1—315 cfm Ing. Rand air cooled 2 stage, 100# powered by Waukesha DIESEL Engine with air receiver mtd. on 4 steel wheels with towing tongue.
1—105 cfm Ing. Rand 4x5 GASOLINE mtd. on trailer with gas and air tanks.
2—105 cfm 100# Penna driven by Buda GASOLINE Engines.

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BOILERS

3—1000 HP, Vogt, class VR, bent tube, water tube boilers, 300 lb. PSI, capacity 60,000 lbs. steam per hour, complete with Foster-Wheeler superheater, natural gas fired, ASME code. Used less than 2 years after installation in 1943.
2—800 HP, Babcock & Wilcox, integral furnace, type FF-16-44, water tube boilers, 200 lbs. PSI, capacity 54,000 lbs. steam per hour, natural gas fired, forced draft. Each boiler equipped with B. F. Sturtevant, size 100, design 7, class III, fans. Driven by Worthington-Moore steam turbine. Used less than 2 months after installation in 1946.

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FOR SALE: At Craig, Colo., 828' of 6⅝" OD 24# 8 RT R 2 and 3 J-55 ST&C New Seamless Steel Casing $1.94 per foot. 787' of 10¾" OD, 40.50# H-40 R2 ST&C Seamless Steel New Casing $3.13. Cities Service Oil Co., Patridge, Bartlesville, Oklahoma.

FOR SALE at Bartlesville, one slightly used Addressograph Graphotype Model #6253. Hand operated with 110 volt motor drive. $450.00. Cities Service Oil Co., Patridge, Bartlesville, Okla.

NATIONAL "50" Compound Double Drum Rig 126' Cantilever Ideco Mast, 10' substructure, 6,000' 4½" drill pipe, this rig complete and in excellent condition. P.O. Box 205 Sta. B, Bakersfield, California.

FOR SALE: 3,200 ft. of 5 9/16"-22# Range 2 Drill pipe with Reed shrink grip, full hole tool joints. Pipe and joints in excellent condition. Priced right to sell.
2—110 H.P. 250# Oilwell "Locomotive Type" Steam Boilers. Boilers practically new, used only a short time. Boilers built in 1938. Boilers can be operated at full pressure under any state or insurance regulations. Priced right to sell.
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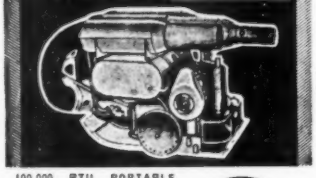

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ONE 8'x27½ Type XYCP National Emulsion Treater complete. Never used, located Basin, Wyoming. Considerable reduction. Write Box 754 or phone 93193, Billings, Montana.

FOR SALE: Approximately 25 miles 4" OD plain end pipe in line. Public Service Corp. of Texas, 902 Burk Burnett Bldg., Fort Worth, Texas.

FOR SALE: Approximately 15,000 feet of 6" OD "Invasion" Steel Pipe, Wt. about 9#, 6⅝" OD Plain Ends, 20' lengths. New condition. Also, approximately 15,000 feet of 6⅝" OD Plain End Stand Black Steel Pipe, No. 2 Grade. M. KAPLAN & SON, Box 1883, Phone 942, Monroe, Louisiana.

FOR SALE: Jumbo J. Fort Worth Spudder mounted on 1000x20 dual tires front and rear. 60 ft. steel mast, roller bearing crown sheave. Complete with tools and casing or will sell separately. Write L. K. Jones, Box 128, or Phone 680, Emporia, Kansas.

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STEEL STORAGE TANKS

Railroad Tank Car Tanks, 6,500 to 12,000-Gal. Cap. Coiled and Non-Coiled.

Cleaned—Painted—Tested
Heavier—Safer—Cheaper
Other Tanks, Too.

Also — Complete Tank Cars 8,000 and 10,000-Gal. Cap.

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4—Fuel Oil Tank 10'6" dia. x 31'
2—Steel Tanks 50' dia. x 33'
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6—Steel Tanks 15' dia. x 47'

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Many other items available. Pumps, Motors, Transformers, Agitators, Reducers, etc.

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EQUIPMENT WANTED

WANTED: Portable trailer or truck mounted Rotary suitable for 2500' drilling. Wish to exchange 1500' truck mounted rotary and pay difference. No junk. Box 378, Cherryvale, Kansas.

WANTED: Two Sweetland Presses; Size #3 to 7 inclusive. Also, Oil Canner. Oklahoma Refining Company, Box 1265, Seminole, Oklahoma.

WANTED: 3,000 ft. to 4,000 ft. Rotary Drill Rig complete. Under $25,000.00. Must be diesel power. Write L. K. Jones, Box 128, or Phone 680, Emporia, Ks.

WANTED: 36-L or 48-L Bucyrus-Erie Spudder or 83 Star Spudder. Write L. K. Jones, Box 128, or Phone 680, Emporia, Ks.

WANTED TO BUY: 24-L or 28-L spudder with or without equipment. Send data and price. General Oil Company, Box 1755, Parkersburg, W. Va.

ROYALTIES

DEEDED ROYALTIES
San Juan Basin & Permian Basin. Write Harry S. Wright, Wright Bldg., Farmington, New Mexico.

HELP WANTED

WANTED—Petroleum engineer with production and well completion experience in Texas and other states, capable of handling all drilling and developmenet problems of small but aggressive company. Please give complete data and references in first letter. Box D-335, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED—Geologist with major company experience, for general work in Mid-Continent area, Tulsa headquarters. State age, experience and salary expected. Address: P. O. 1743, Tulsa, Oklahoma.

ENGINEERS, Executives, Technical Men. Salaried positions — $3600 to $30,000. This confidential service for outstanding men who desire a change of connection, will develop and conduct preliminary negotiations without risk to present position. Send name and address for details. Tomsett Associates, 1204 Berger Bldg., Pittsburgh 19, Pa.

NEW foreign and domestic Oil Employment Directory. Over 500 listings in drilling, production, refining, natural gasoline, pipe lines, geological, exploration, supplies, manufacturers, services; and trucking, refinery and pipe line contractors, showing where to apply for jobs. Price $5.00. Oil Industry Mailing List, Box 2603, Tulsa, Okla. (Our 28th year).

DRILLERS and helpers for water wells. Men of good habits who want steady work. Write Layne-Northwest Co., 6005 W. Martin Drive, Milwaukee 13, Wisconsin.

INDEPENDENT oil company with AAA-1 financial rating wants geologist minimum fifteen years experience geological and land department work. Experience in Oklahoma and land department experience essential. Attractive proposition including option to participate at base cost after drilling of well. Box D-330, The Oil and Gas Journal, Tulsa, Oklahoma.

SITUATIONS WANTED

SUPERINTENDENT of Construction or Maintenance available immediately. Three years University in C. E. and P. E. 25 years diversified experience in refining, pipeline, production, and geophysics. Excellent health. Location immaterial. Desires permanent connection with good opportunities. Would start as resident engineer. Benson Merchant, 1402 South Rockford, Phone 2-4663, Tulsa.

PETRO. ENGINEER-ATTORNEY: 31, B.S. Pitt '40, three years' experience, major oil company, three years Navy petroleum inspection, LLB. Mich. '49, recently passed Pa. bar exam. Desires opportunity in oil industry utilizing education and experience. Anything, excepting patent law. Box D-319, The Oil and Gas Journal, Tulsa, Oklahoma.

DESIRES CHANGE — Experienced male secretary and chief clerk, age 35, 13 years with one major oil company, still employed, desires Tulsa location. Excellent ability ratings. Willing to travel. Box D-334, The Oil and Gas Journal, Tulsa, Oklahoma.

INSTRUMENT SUPERVISOR — Mechanical engineer with thirteen years experience in chemical plants and petroleum refinery. Box D-333, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST, B.S., 3½ yrs. subsurface experience in Cuba and Venezuela, desires a position with aggressive company, preferably domestic. Box D-308, The Oil and Gas Journal, Tulsa, Oklahoma.

GAS ENGINEER: 10 years general experience in design, construction and operation of gas gathering and processing plants. 37 years old. Married and settled. Excellent references. Box D-327, The Oil and Gas Journal, Tulsa, Oklahoma.

MASTER MECHANIC, Engineering education, wide experience diesel, gas, dual fuel engines, pumps, compressors. Routine breakdown, preventive maintenance. Available for employment Mid-Continent or Central South. Box D-331, The Oil and Gas Journal, Tulsa, Okla.

SITUATIONS WANTED

ATTENTION: Well established oil well drilling contractor desires to manage and supervise: Individuals', groups', small or medium-sized oil companies' drilling, production and operating problems in Central and Western Texas, and New Mexico Personal interview by appointment is desired. Makin Drilling Company, Box No 131, Ph. No. 131, Hobbs, New Mexico.

EXPERIENCED Man to take charge field office and warehouse. Single, sober. Free to go anywhere. Good references. Box D-338, The Oil and Gas Journal, Tulsa, Oklahoma.

EXPERIENCED Office and Credit Management, Purchasing, Sales, Personnel and Administrative Work. Industrial and Oil Field Supplies. Presently employed Houston, but willing to move. Seek greater responsibility and opportunity. Excellent references. Write Box D-321. The Oil and Gas Journal, Tulsa, Okla.

PRODUCTION Superintendent, graduate petroleum engineer, 36, experienced all phases drilling, completion, production. Desire responsible connection with active organization. Excellent references. Box D-295, The Oil and Gas Journal, Tulsa, Oklahoma.

ORGANIC CHEMIST, Graduate degrees and Industrial experience, interested in chemicals from Petroleum wants research, development position. Box D-329, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE

TRUCK LETTERING AND TRADEMARK DECALS made for your trucks and equipment. Easy to apply, uniform, distinctive, economical for small or large needs. Write for catalog. MATHEWS COMPANY, 827 S. Harvey, Oak Park, Illinois.

BUSINESS OPPORTUNITIES

WANTED
FINANCIAL ASSISTANCE OR MATERIALS

For obtaining franchises and building gas distribution systems. Have locations established.

Box D-336
The Oil and Gas Journal, Tulsa, Okla.

ATTENTION

Oil and Gas Producers

Will furnish materials, erect and operate gasoline plant in exchange for gas of sufficient gasoline content—15 to 50 million C.F. P.D. desired.

Box D-332
The Oil and Gas Journal, Tulsa, Okla.

REAL ESTATE

INDUSTRIAL LOCATION

East Texas Oil Field, suitable for Manufacturers—Truckers—Heavy equipment over 3 acres land, 2 all steel buildings 36 x 80 one with 17 x 80 leanto, both have 6 inch cement floors, and wired for 110-220 and 440. Five ton overhead crane, with tracks in and connecting both buildings. Also nice four office frame building included. This property located at Gladewater, Texas, 2 blocks from downtown. Sells complete for $25,000. Call or write

SHIPP BROS.
Gladewater, Texas

LEASE AND DRILLING BLOCKS

FOR SALE: Oil lease, partially under water flood. 900 acres under lease, of which 320 acres proven productive. Located Southeast Kansas. P. O. Box 31, Chanute, Kansas.

LEASE AND DRILLING BLOCKS

FOR LEASE—The only unleased quarter section that I know of in the Haskell County, Kansas, sector of the huge Hugoton gas pool. $2.00 per acre down, $1.00 per year 10 years. Box D-337, The Oil and Gas Journal, Tulsa, Oklahoma.

OIL LANDS available Western Canada. Freehold leases and reservations from one hundred and sixty to one million acres. Reference—any bank in Toronto, Ontario. Gordon Jones, 200 Bay Street, Toronto, Canada.

FOR SALE: Oil and Gas Leases and drilling propositions in shallow territory of Allen, Simpson, and Warren Counties, Kentucky. W. P. Harley, Bowling Green, Kentucky.

SEE A. L. BOWLES, ADA, OKLA., FOR DRILLING DEALS, LEASES, ROYALTIES

HAVE Kansas Water-flood prospect. Producing natural since 1911. Would like to hear from parties that would be interested in taking exploratory cores. Box 508, Emporia, Kansas.

SCURRY COUNTY ROYALTIES
Send for list of choice Scurry County royalties. Also have few townsite lot leases $300. Navarro Royalties Company, Odessa, Texas.

LEASES ROYALTIES
Producing and Nonproducing
Bought and Sold—Any Area
Inquiries Invited
B. D. BUCKLEY
6376 Clayton Road, St. Louis 17, Mo.

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(Purchase orders accepted only from those connected with the oil industry or royalty business.)

Wire, Write or Call

JOHN ALLEN
Suite 200, Grand Pacific Hotel
Bismarck, North Dakota

(Member National Oil Scouts and Landmen Association. References exchanged.)

NOTICE

Notice is hereby given that Valley Investment Company will receive bids on or before February 1, 1950, for the purchase of its undivided one-half (½) interest in and to the seven-eighths (⅞) oil, gas and mineral leasehold interest in the West One-half (W ½) of Section Eighty-three (83), Block Ninety-seven (97) of the H. T. & C. Railway Company Surveys, Mitchell County, Texas, together with four (4) producing wells thereon, and its one-half (½) interest in the personal property thereon, subject to one-half (½) of existing oil payments in the sum of Eight Thousand and no/100 ($8,000.00) Dollars, payable out of one-eighth (⅛) of seven-eighths (⅞), and subject to one-half (½) of one-sixteenths (1/16) of seven-eighths (⅞) overriding royalty interest therein.

All bids must be submitted at the office of Valley Investment Company, San Juan, Texas, on or before February 1, 1950, accompanied by a certified check or cashier's check in the amount of Ten (10%) percent of such bid, as an evidence of good faith.

ATTN: J. FLOYD HETRICK

Valley Investment Co.
San Juan, Texas

PATENT ATTORNEYS

PATENT Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorneys, Suite 418, 815-15th Street, N.W., Washington 5, D. C.

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CALENDAR

January

Society of Automotive Engineers, annual meeting Hotel Book-Cadillac, Detroit, January 9-13.

February

Southern Gas Association, meter and regulator conference, Houston, February 9-10.

American Institute of Mining and Metallurgical Engineers, annual meeting, Hotel Statler, New York, February 12-16.

American Institute of Chemical Engineers, regional meeting, Houston, February 26-March 1.

American Society for Testing Materials, spring meeting, Hotel William Penn, Pittsburgh, February 27-March 3.

March

American Petroleum Institute, Division of Production, Southwestern District meeting, Adolphus Hotel, Dallas, March 8-10.

Indiana Independent Petroleum Association, spring convention, Hotel Severin, Indianapolis, March 9-10.

North Texas Oil and Gas Association, Kemp Hotel, Wichita Falls, March 25.

Southern Gas Association, Galveston, Tex., March 27-29.

Western Petroleum Refiners Association, annual meeting, Plaza Hotel, San Antonio, March 27-29.

American Petroleum Institute, Division of Production, Mid-Continent district meeting, Skirvin Hotel, Oklahoma City, March 29-31.

April

National Association of Corrosion Engineers, annual conference, Jefferson Hotel, St. Louis, Mo., April 4-7.

American Society of Mechanical Engineers, Hotel Statler, Washington, D. C., April 10-14.

Southwestern Gas Measurement Short Course, University of Oklahoma, Norman, Okla., April 11-13.

National Petroleum Association, Hotel Cleveland, Cleveland, Ohio, April 12-14.

American Petroleum Institute, Division of Production, Rocky Mountain district meeting, Gladstone Hotel, Casper, Wyo., April 13-14.

Natural Gasoline Association of America, annual convention, Texas Hotel, Fort Worth, April 24-26.

Oil Heat Institute of America and National Oil Heat Exposition, annual meeting, Commercial Museum, Philadelphia, April 24-May 1.

American Petroleum Institute, Division of Production, eastern district meeting, Cleveland Hotel, Cleveland, April 26-28.

May

American Petroleum Institute, Division of Refining, midyear meeting, Hotel Cleveland, Cleveland, May 1-4.

Interstate Oil Compact Commission, spring meeting, Biloxi, Miss., May 4-6.

Independent Petroleum Association of America, midyear meeting, Biltmore Hotel, Los Angeles, May 7-9.

National Stripper Well Association, Biltmore Hotel, Los Angeles, May 7-9.

American Gas Association, Natural Gas Department, spring meeting, Mayo Hotel, Tulsa, May 8-9.

Liquefied Petroleum Gas Association, annual convention, Palmer House, Chicago, May 8-11.

American Petroleum Institute, Division of Production, Pacific Coast district meeting, Biltmore Hotel, Los Angeles, May 11-12.

American Gas Association, production and chemical conference, Hotel New Yorker, New York, May 22-24.

American Institute of Chemical Engineers, regional meeting, New Ocean House, Swampscott, Mass., May 28-31.

June

National Oil Scouts and Landmen's Association, Skirvin Tower Hotel, Oklahoma City, June 8-10.

American Society of Mechanical Engineers, oil and gas power division, Lord Baltimore Hotel, Baltimore, June 12-16.

American Society of Mechanical Engineers, Hotel Statler, St. Louis, June 19-23.

Pennsylvania Grade Crude Oil Association, Hotel William Penn, Pittsburgh, Pa., June 15-16.

Canadian Gas Association, annual convention, Manior Richelieu Hotel, Murray, Quebec, Canada, June 20-24.

American Petroleum Institute, midyear division of production and standardization conference, Brown Palace Hotel, Denver, June 26-30.

American Society for Testing Materials, annual meeting Chalfonte-Haddon Hall, Atlantic City, N. J., June 26-30.

August

Interstate Oil Compact Commission, summer meeting, French Lick, Ind., August 3-5.

September

American Society of Mechanical Engineers and Instrument Society of America, Municipal Auditorium, Buffalo, N. Y., September 11-15.

National Petroleum Association, Hotel Traymore, Atlantic City, N. J., September 13-15.

American Society of Mechanical Engineers, petroleum mechanical engineering conference, Roosevelt Hotel, New Orleans, September 25-27.

October

American Gas Association, annual convention, Atlantic City, N. J., October 2-6.

Mid-Continent Oil and Gas Association, Texas division, Dallas, October 4-5.

American Association of Oilwell Drilling Contractors, annual meeting Mayo Hotel, Tulsa, October 9-10.

November

American Petroleum Institute, annual meeting, Biltmore and Ambassador Hotels, Los Angeles, November 13-16.

American Society of Mechanical Engineers, Hotel Statler, New York, November 26-December 1.

NOMADS

Tulsa Nomads, third Friday of each month. After Five Room, Tulsa Hotel.

Dallas Nomads, first Monday of each month, Texas Room, Baker Hotel.

Houston Nomads, second Monday of each month. Ye Ole College Inn, Houston.

Los Angeles Nomads, second Wednesday of each month, Jonathan Club.

New York Nomads, election and business meeting, Louis Sherry's, January 9.

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